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Individual Labor Agreements More Practical than National Ones

DURING the last ten years the electric railway industry has sounded the depths of tribulation. When the costs of operation went up by leaps and bounds, adequate increases in fares were not permitted. The companies have been harassed by unfair jitney competition, burdened with inequitable taxes and frequently made the football of politics. But one burden they have been spared. There has been no national labor agreement. This has been a good thing for the companies, for the men and for the public.

During the past four months one of the important and necessary utilities of the country has been paralyzed and another threatened because of national agreements. Numerous conferences have been held, federal and state authorities have endeavored to assist in the bringing about of a settlement, and the continued progress of industry and commerce has been threatened with interruption. A national agreement for any industry does not take into consideration the great differences in living conditions which exist in various parts of the country. What would be a hardship in wages and working conditions in one part of the country might easily be very satisfactory in another part. Moreover, if industrial relations become mutually satisfactory on one property, they should not be forced artificially to remain strained because others at a distant point cannot agree on what is best to do. This practice on electric railways of individual labor agreements should be borne in mind with any consideration of electric railway securities as investments.

The Coal Situation Requires Close Attention

THE Federal Fuel Distributor has now completed his organization and in order to co-operate with the government, the American Electric Railway Association has combined with the National Electric Light Association and the American Gas Association in the appointment of an executive representative at Washington to handle coal matters. This is one of the ways in which the association is endeavoring to look out for the requirements essential to uninterrupted operation of the electric railways.

It is evident that John Lewis has scored a triumph by keeping his forces intact through the summer until the public necessity for coal has made a resumption of work imperative. For the general situation is becoming alarming, though at the moment the electric railways do not seem to be in imminent danger of a shut down from lack of coal. The present situation in the coal strike seems to be that of marking time while results from the Cleveland conference are awaited. The plan of settlement being discussed includes the resumption of operation by mine workers and operators on a status quo basis under the conditions of March 31, 1922. It is planned that by Oct. 31 an advisory committee is to be elected, composed equally of operators and miners, which committee is to make a complete investigation of the coal situation and report its recommendations as to the best way to conclude future wage scales, etc. This committee, it is understood, is designed to take the place of the commission that President Harding has been proposing to accomplish the same ends. The difference would be that in the one case the entire matter would be retained within the industry and in the other the government would be a party.

Coal stocks are now lowered to a point where close co-operation by all utilities is necessary in order to prevent closing down of service. The appointment of the Washington representative should do much to speed up the various operations necessary in order to secure prompt assignment and delivery. His services should be freely used by the electric railways if their local situation becomes acute.

Advance in Underfeed Stoker Design

THE pioneer installation of a new design of underfeed stoker for burning Northern Illinois, high-ash, clinkering coal recently completed its first year of service in the power plant of the Twin City Rapid Transit Company, Minneapolis, Minn. During this time it has successfully performed the service for which it was designed—an accomplishment of considerable credit to the originator, E. H. Scofield, who evolved the special features that adapt an ordinary underfeed stoker for the combustion of fuel having clinkering tendencies.

The stoker is described elsewhere in this issue. Two factors were recognized as prerequisites in obtaining fuel-bed conditions which would minimize the undesirable characteristics of this coal. The first of these, a slightly agitated and uniformly progressive fire bed, was brought about by the addition of a secondary ram to each retort. By the action of these rams the force for advancing the burning fuel is applied at two points along the fire bed instead of one, with a consequent reduction in disturbance to fuel, the clinkering tendency of which is aggravated by excessive agitation. The other beneficial condition is a low fuel-bed temperature. This was provided in the design of the setting by creating circumstances particularly favorable to a high heat absorption directly from the fuel by the exposed boiler heating surface.

In considering the results accomplished in the latest design, due credit must be accorded the working out of boiler and stoker installation as a unit. In other words, beneficial furnace and boiler conditions contribute materially to the high average efficiency of 70 per cent which has been obtained in Minneapolis. This

performance is exceptional with coal averaging 9,500 B.t.u. per pound. It is difficult, of course, to determine what part of the increase in efficiency over the old installation can be credited to the stoker and what to the redesigned boiler setting and baffling. But the value of the co-ordination between the two is evident.

A solution of the problem of burning low-grade clinkering coal in underfeed stokers would put fuel of this variety on a basis comparable with high-grade coals in respect to the high rates of combustion possible and the satisfactory behavior of the fuel while burning. This would mean a distinct saving in energy costs to generating companies in the clinkering coal regions. That power plant engineers have been awaiting equipment which could do this seems to be demonstrated by the fact that a number of installations of this type of stoker are now under way in the territory where fuel having high percentages of moisture, ash and sulphur prevails. These installations are based on the excellent performances of the Twin City plant.

The Six-Day Traction Strike in Chicago

AFTER the longest complete tie-up of both elevated and surface lines ever experienced in Chicago the trainmen have won a wage 7 cents an hour higher than is paid any other surface electric railway employees in the country. They also retain the eight-hour day. Yet Mr. Blair was severely criticized locally for his alleged unwillingness to concede a point here to gain a point there. In the end it was he who conceded nearly everything. There was a conspicuous absence during the negotiations of evidence showing why a 65-cent scale, the company's initial compromise offer, was not a fair wage. The union officials side-stepped the fair living wage issue. They pointed repeatedly to the magnitude of the 15 cent reduction. It meant $8 to $10 a week to each trainman, which would be quite a sum to lose at one cut. Had the 15-cent reduction been arrived at by small steps begun earlier it might have seemed less formidable to the men.

The trainmen ignored the fact that a street railway must be conducted on a business basis. Mr. Blair showed from the first forty-five days' operation under the 7-cent fare that the 1-cent reduction from 8 cents had caused a $17,300 decrease in daily revenue—equivalent to about $6,300,000 a year. The wage reduction will absorb only about $4,000,000 of this. If there is to be any profit in the business, therefore, the company will have to find ways and means of making large operating economies. Substantial savings are not impossible provided the co-operation of the trainmen is had. Having won so liberal a wage settlement the men should be in the frame of mind and have the good sense to agree wholeheartedly to plans for better operation that will possibly enable the company to continue the present scale without bankruptcy.

The situation of the elevated railway employees in this strike was unique. They had no quarrel with the management. No contract existed, as the previous contracts, Surface and "L," had expired on June 1, 1922. There was no plan on foot to cut wages as long as the present rate of fare prevailed. But to make an issue for standing with the surface lines union, the elevated union demanded that the company sign up for a year at the old 82-cent rate. Of course this could not be done. A small meeting stormed by strike advocates precipitated a strike simultaneous with the surface strike. The outcome of the strike was an agreement on a new wage 10 cents an hour lower. The men hastened a cut in their own wages by striking. They deserved to suffer the reduction at once. But President Britton I. Budd ignored their poor judgment and continued the 82-cent rate until such time as the fare is cut by the Illinois Commerce Commission. This evidences a consideration for the viewpoint of the employees that is too seldom seen. It accounts in part for the unusually high morale on the Chicago Elevated Railroads and on the Chicago, North Shore & Milwaukee Railroad.

Putting It Up to the Surface Lines

NO ORDERS will be issued by the New York Transit Commission fixing standards of service for the surface lines of Greater New York. Responsibility for improved service on these lines will be placed primarily with the operators, with the commission maintaining regulatory supervision. This is the decision of the commission following its inquiry into the conditions affecting the surface lines and is in accordance with the suggestion made to the commission by Gen. Lincoln C. Andrews, chief executive officer. Representatives of the sixteen companies who appeared before the commission on Aug. 3 have agreed on their part to meet with the members of the commission once a month with a view to exchanging ideas and suggestions looking to a general improvement in equipment, plant and schedules.

Here is an instance of frank recognition by a public regulatory body of the adverse conditions under which surface railways have operated during the war-time period and of the efforts that are now being made to restore the physical properties to something like their normal state. Conditions were particularly unfortunate for the surface companies in New York City in that many of them were cast adrift from the properties of which they were formerly a part and that none of them was permitted to increase its fares, except as an increase resulted indirectly from dismemberment and the curtailment of transfer rights to the passengers. The surface lines in New York survived at all only because of economies which were put into effect that for the most part resulted in deterioration of the physical properties and at the same time—necessarily so—worked to the detriment of the traveling public. During the last year, however, within the limits of their financial condition, the companies have materially improved their efficiency of operation. This the commission knows to be the fact, while the change for the better is also readily apparent to the riding public in the shape of better service and in fewer decrepit cars.

The attitude of the commission is that by interfering least with the companies it is helping them most in working out their own salvation. As General Andrews expressed it, the commission may be expected to secure far better service for the public from the surface companies by leaving the responsibility upon the operator and holding him to it than by issuing orders. The commission is, of course, in a position to judge from its records what the financial conditions of the companies will permit them reasonably to do and to determine for itself as a guide proper standards of service to be met by progressive steps as rapidly as the condition of each company permits. Thus are the companies really put on their mettle.

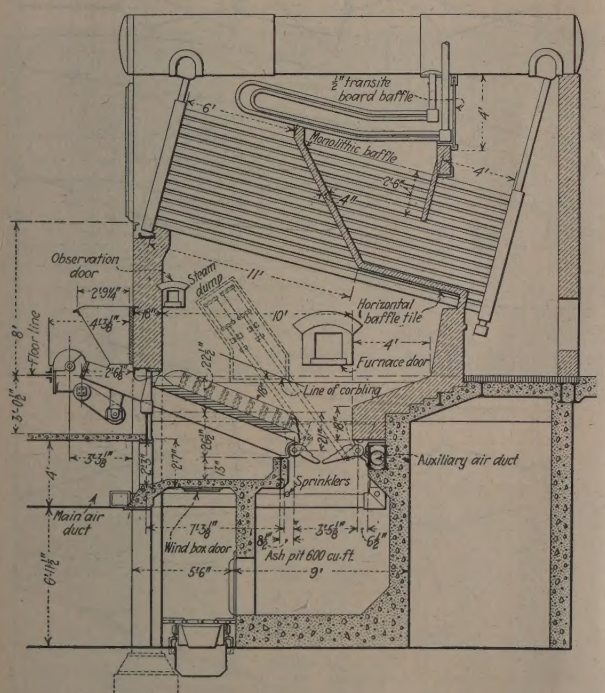
The Underfeed Stoker Successfully Burns Low-Grade Fuel

High-Ash, Clinkering Coal Burned in Specially Designed Underfeed Stokers in Twin City Plant — Operation Featured by Flexibility, High Efficiency, Capacities Up to 350 per Cent, Uniform Thickness of Fuel Bed and Minimum Clinker Formation

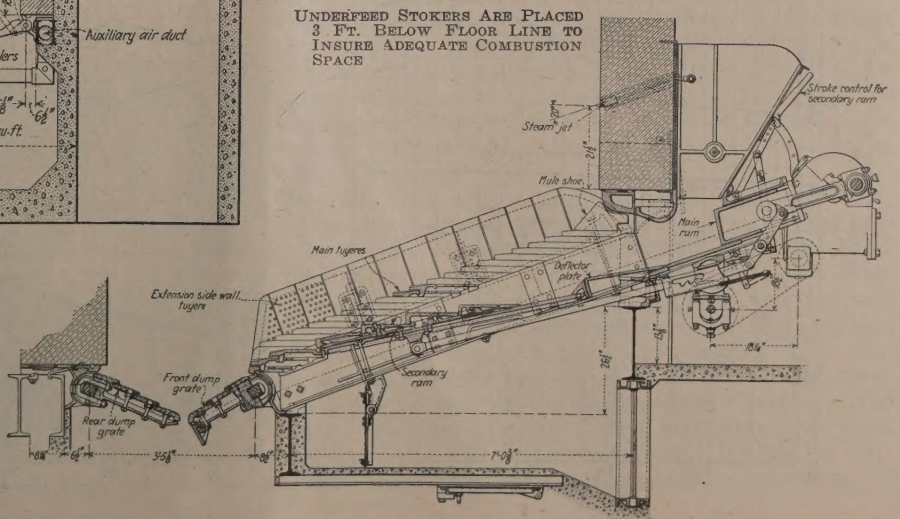
OVER a year ago the Twin City Rapid Transit Company, Minneapolis, Minn., installed underfeed stokers under six 5,560-sq.ft. B. & W. boilers in its steam station located at Sixth Avenue, S.E. and the Mississippi River. These stokers replaced six of the chain grates with which all twenty-eight boilers in the station up to that time had been equipped. The requirements were severe in both capacity and efficiency incident to the demands of a station feeding a widely fluctuating electric railway load. The load characteristics of this plant are still further aggravated by its interconnection with several hydro-electric plants which are kept loaded always to the limit of the water available. The older installation left considerable to be desired in the way of flexibility and economy in addition to being handicapped by a power demand varying between extreme limits and a clinkering fuel of low grade, high in ash, moisture and sulphur. When it was decided several years ago that the performance of the plant must be bettered, doubt was expressed at the possibility of accomplishing such a result with any type of underfeed stoker then designed or in operation, in the belief that the problem of continuous and satisfactory combustion of coals with high percentages of ash, moisture and sulphur had never been completely solved. The working out of these difficulties in the Twin City plant during the past four years has culminated in the use of a specially designed stoker and the redesigning of the boiler setting.

Each of the six installations consists of a Westinghouse six-retort stoker, 10 ft. 8¼ in. in width and 10 ft. ⅞ in. from front wall to bridge wall. The front is set flush with the boiler front, thus eliminating all overhanging brickwork. No ignition arches are used. As the bottoms of the front tube headers are only 8 ft. above the floor line, it was necessary to set the stokers

UNDERFEED STOKERS ARE PLACED 3 FT. BELOW FLOOR LINE TO INSURE ADEQUATE COMBUSTION SPACE



ABOVE, SECTIONAL ELEVATION OF BOILER SETTING AND STOKER INSTALLATION SHOWING LARGE COMBUSTION SPACE, REDESIGNED BAFFLING, AND LENGTHENED SUPERHEATER.



AT RIGHT, SECTIONAL SIDE ELEVATION OF UNDERFEED STOKER FITTED WITH SECONDARY RAMS, DEFLECTOR PLATES AND FRONT AND EXTENSION SIDE WALL TUYERES

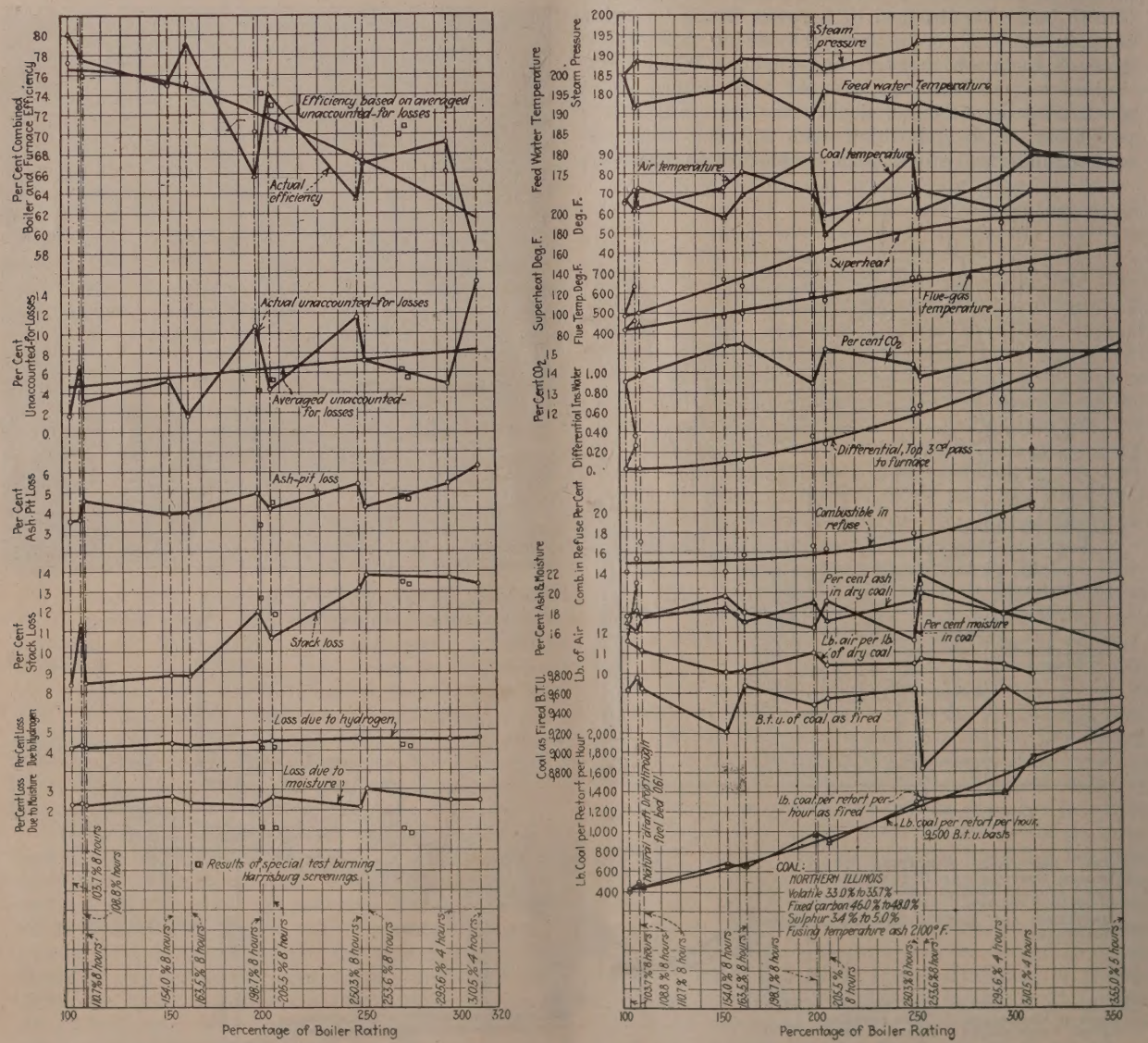
3 ft. below the floor level to secure the desired furnace volume of about 1,300 cu.ft. Each boiler is a thirteen-tube-high, twenty-one-tube-wide, parallel drum, 5,560-sq.ft. B. & W. unit, having 900 sq.ft. of superheater surface but no economizer. The steam conditions at which the boilers work are 190 lb. per square inch pressure and 100 deg. F. superheat at nominal rating. An accompanying illustration shows the general scheme of the stoker setting and the boiler baffling.

Fuel Bed Controlled With Secondary Rams

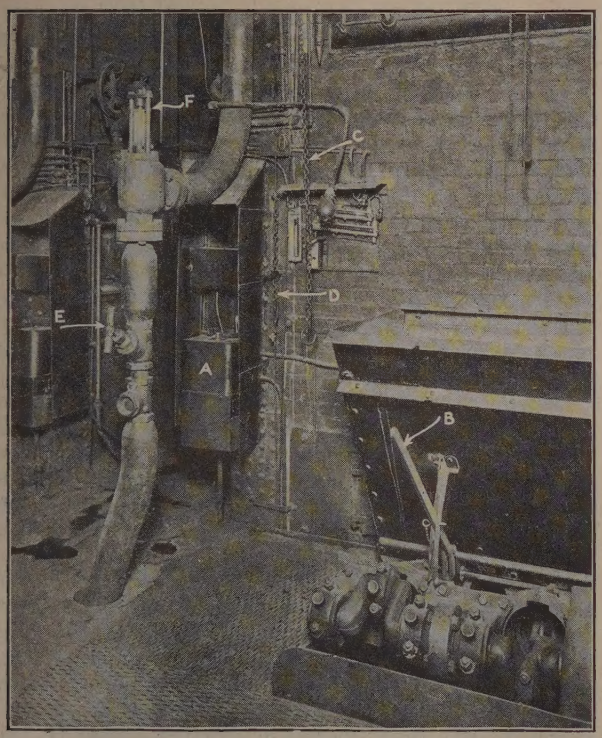
In the working out of the stoker design, several most desirable features were originated to meet the conditions required for the proper burning of Northern Illinois coal. The fuel, as it is introduced from the retorts by the rams, is spread laterally by deflector plates so as to cover the surface of the tuyeres. The action of these plates also loosens the fuel, which, when containing large percentages of moisture and dirt, becomes densely packed under the action of the rams. Secondary step-shaped rams, located midway between the deflector plates and the grate tuyeres, insure a continuous movement of the fuel bed. These rams, under independent control, extend in their action practically to the dump grate, filling in blowholes which may start and also building up the fuel bed to a uniform thickness. Thus the auxiliary rams furnish means for controlling the distribution of coal over the fuel bed and for agitating slightly the lower fuel bed. At the same time all grate surface is made effective for combustion. Thus it is seen that a fuel bed of uniform thickness is made to travel steadily toward the rear with suitable agitation. In practice the stoker has been found to maintain these conditions, an accomplishment to which are credited the beneficial combustion conditions.

Secondary Ram Adjustment

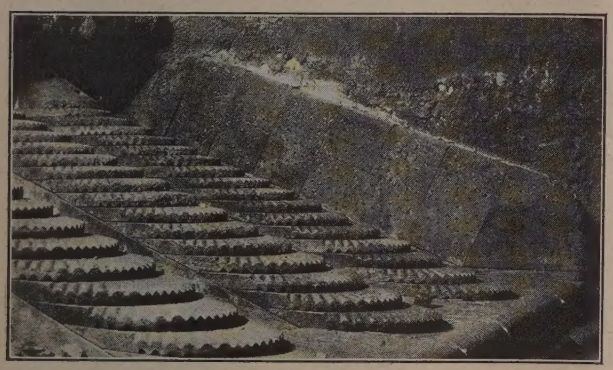
Each secondary ram is driven by its individual feed ram, although the length of stroke of all secondary rams is regulated by one adjustment lever shown in one of the accompanying illustrations. On the upper end of the auxiliary ram driving rod is a block with four notches which is engaged by a pin driven through a fixed stroke by a series of links from the primary ram. According to which of the four notches the pin engages, the lost motion of the link movement is taken


Per Cent Combined Boiler and Furnace Efficiency
Efficiency based on averaged unaccounted-for losses
Actual efficiency
Per Cent Unaccounted-for Losses
Actual unaccounted-for losses
Averaged unaccounted-for losses
Per Cent Ash Pit Loss
Ash-pit loss
Per Cent Stack Loss
Stack loss
Per Cent Loss Due to Hydrogen
Loss due to hydrogen
Per Cent Loss Due to Moisture
Loss due to moisture
Results of special test burning Harrisburg screenings
Percentage of Boiler Rating
Steam pressure
Feed water Temperature
Air temperature
Coal temperature
Superheat
Flue-gas temperature
Per cent CO2
Differential, Top 3rd pass to furnace
Combustible in refuse
Per cent ash in dry coal
Per cent moisture in coal
Lb. air per lb. of dry coal
B.t.u. of coal as fired
Lb. coal per retort per hour as fired
Lb. coal per retort per hour, 9,500 B.t.u. basis
COAL:
NORTHERN ILLINOIS
Volatile 33.0% to 35.7%
Fixed carbon 46.0% to 48.0%
Sulphur 3.4% to 5.0%
Fusing temperature ash 2,100° F.

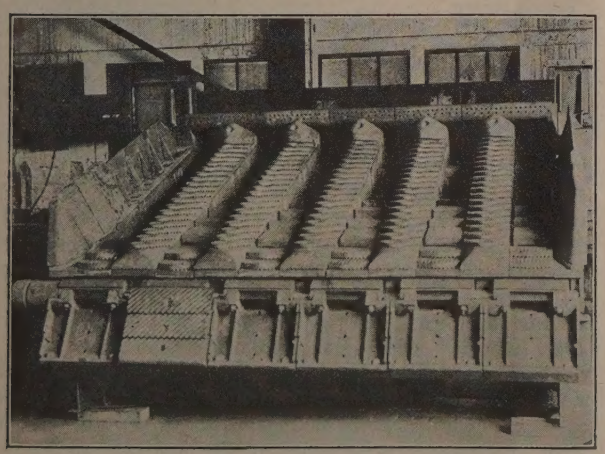
Graphs from Twelve Performance Tests of Boiler with Redesigned Setting and Special Underfeed Stoker



CONTROL FOR EACH BOILER IS LOCALIZED. *A*—STOKER SPEED CONTROL. *B*—STROKE CONTROL FOR SECONDARY RAMS. *C*—UPTAKE DAMPER CONTROL. *D*—WIND BOX DAMPER CONTROL. *E*—FEED LINE VALVE. *F*—GAGE SHOWING RATE OF FEED-WATER FLOW



AN EXTENSION SIDE WALL TUYERE WITH PERFORATED COVER PLATES IN PLACE. (NOT TWIN CITY INSTALLATION)



STOKER PARTLY ASSEMBLED, SHOWING DETAILS OF CONSTRUCTION

up so as to vary the stroke of the secondary ram from zero to 6 in. The control of the lost motion is effected by the use of a selector block, which slides under the pin and prevents it from engaging any but the desired notch. The details of this construction are shown in an illustration.

Another refinement required was the use of extension side wall tuyeres, which extend approximately to the top of the fuel bed. They are so designed that there are no dead pockets for the lodgment of partially burned coal or clinkers and they protect the walls from the direct heat of the fuel bed and prevent clinkers from forming on the side walls. Both the side-wall tuyeres and front-wall air boxes admit a limited amount of air underneath and near the surface of the fuel bed, tempering the gases and forming a cool blanket over the lower furnace walls. The reduced temperature in that region is helpful in protecting the brickwork. A battery of high-velocity steam jets, placed in the front wall about 18 in. above the fuel bed surface and directed parallel to that surface, insures complete combustion by thoroughly mixing the gases before they enter the tubes. These jets also divert the gas flow toward the back wall of the furnace, providing for a sweep of the gases over the full length of the exposed boiler tubes.

Two sets of dump grates are provided for emptying the ashes into the ashpits. One of these is hinged to the lower end of the stoker and the other to the rear wall support. Each is actuated by an individual steam ram located on the outside of the boiler setting. The stroke of these rams can be controlled by the setting of a collar located on the piston. The front dump grate, by its lifting action, may be used to break up clinkers as they pass to the rear dump and also to hold back the fuel bed when the rear dump is dropped. Air for combustion is supplied under control to both front and rear dump grates. This auxiliary air supply enters through a duct inclosed in one of the steel members that support the lower end of the bridge wall. The entire grate surface thus becomes active when required and the carbon is burned down to a low percentage of the refuse before dumping. Also ashes may be dumped frequently on heavy loads without interfering with the output or efficiency and refuse is disposed of before it builds up into large clinkers.

BAFFLING GIVES UNIFORM GAS VELOCITY AND EXPOSES LOWER TUBES TO RADIATION

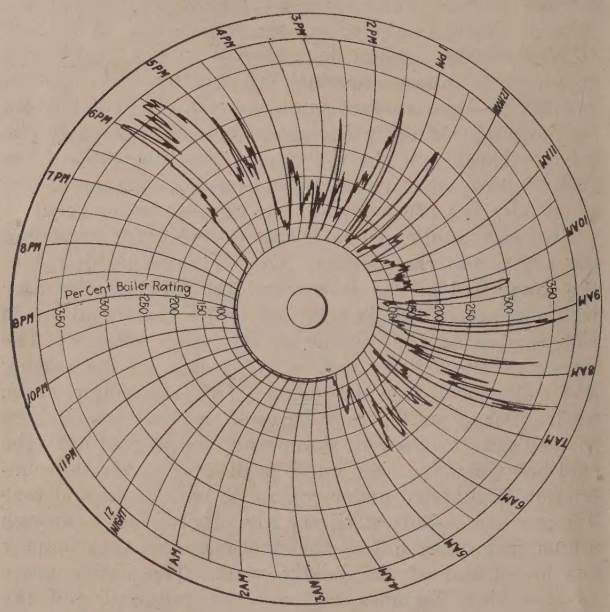
With the installation of the underfeed stokers special baffling was designed to give a cross-section of passage through the boiler approximately proportional to the volume of the gases. In other words, practically a constant gas velocity is established by decreasing the cross-section of the passes in the same ratio that the gases contract due to the abstraction of the heat by the tubes.

The bridge wall and baffling are so located as to expose 90 per cent of the tube length, giving a tube area double that of the grate to absorb heat by the direct radiation from the fire. The bridge wall rises from the dump grate to a level with the surface of the rear of the fuel bed and then recedes to the rear, meeting the tubes at the back end of the boiler. With this condition of tube exposure it is estimated that more than 50 per cent of the total heat is absorbed in the first two rows of tubes. The high heat absorption directly by radiation accounts largely for the low furnace temperature and consequently a minimum of

clinker formation. The ashes as they are raked from the ash pit contain only lumps of moderate size. That this should be so is highly important because before dropping onto the bucket conveyor the ashes must pass through an 8x8-in. cast-iron grid.

If it resulted in excessive clinkering this system would be objectionable because the refuse would have to be reduced to the proper size before it could be handled in the conveyor.

In connection with the design of the furnace it might well be mentioned that the angles of the stoker, the front wall and the bridge wall are so arranged that the radiant heat which does not enter the tube surface directly reaches the boiler with but one reflection. Such a condition means that the maintenance of furnace walls and other brickwork is considerably lowered by the



STEAM FLOW CHART SHOWING WIDELY FLUCTUATING LOADS

elimination of double and triple reflections. After eighteen months' operation the furnace settings have received no repairs of brick linings and there is practically no accumulation of slag on the walls.

SUPERHEATER SURFACE INCREASED

Because of the large proportion of heat absorbed directly from the fuel bed by the first two rows of tubes and because of the redesigned baffling, it was thought that the area of the old superheaters would be insufficient to maintain the required degree of superheat. Under the new conditions it was estimated that the temperature of the gases as they entered the second pass would be considerably lower than formerly. The superheater, consequently, was lengthened so that the bends extended over the first pass instead merely of just up to the first baffle. This gives the effect of a double-pass superheater. Its area was increased from 550 to 900 sq.ft. by this extension to insure that at least the same superheat would result. With the boiler operating at about 170 per cent of rating the superheat formerly averaged about 100 deg. F. An accompanying chart shows how it was increased to 140 deg. F. at this rating and also how it continued to increase as the boiler was forced to higher ratings.

In connection with the redesigning of the superheater, an improvement in the construction of the rear baffle was worked out which made it unnecessary to utilize the superheater headers to support the baffle tile. Instead of baffle tile in that position, between the lower superheater headers and the boiler drums, ½-in. transite board has been used. It is secured between two "L" holders, the upper one being hung from ⅞-in. rods passing over the boiler drums. The lower one is built into the section of tile baffling resting on the upper rows of boiler tubes. Seven sections, 21 in. x 4 ft., are required per boiler, each section being reinforced vertically with an angle and a channel. The advantage of this type of construction is that the baffling is readily removable and that it is independent of the expansion and contraction of the superheater risers.

Experience with this equipment has demonstrated the possibility of operating throughout a range from 100 to 350 per cent of rating, as will be noted on the boiler record chart. At the higher rating low-grade fuel is burned at a rate of 1 ton per retort per hour and the refuse is disposed of with no excessive loss of carbon or loss of capacity or efficiency while dumping. Whether or not this high rating is the limit of the stoker capacity has not yet been determined, for the rate of evaporation was limited by the capacity of the feed pipes and the feed line to furnish the boiler with water.

This design of stoker and furnace has demonstrated other advantages. It is possible to control the air supply to the most efficient proportions, little if any slag is formed on the furnace wall and highest efficiency is secured at or near normal rating. The stoker maintenance has been low and the percentage of combustible in the ash has been reduced to a negligible proportion.

The performance of this equipment is shown in accompanying curves. The data were obtained from a series of twelve tests, at outputs ranging from 100 to 350 per cent of rating, conducted under the direction of E. H. Scofield, engineer of power, by representatives of the Westinghouse Electric & Manufacturing Company and of the Twin City Rapid Transit Company. The fuel characteristics and operating conditions varied as outlined in the following tabulation, the result of each test being reduced to a basis of conditions shown in the third column:

	Minimum	Maximum	Curve Basis
Coal:			
Moisture, per cent	14	20	18
Ash, per cent	16	22	18
Sulphur, per cent	3.5	5	4
Volatile, per cent	32	35	33
Fixed carbon, per cent	45	48	45
Ash fused at, deg. F.	.....	.....	2,100
B.t.u., commercial, per pound	8,827	9,750	9,550
B.t.u. dry	.....	.....	11,650
B.t.u. combustible	.....	.....	14,200
CO_2 at top of third pass, per cent	13.5	15.5	14–15
Carbon in refuse, per cent	13.0	20.0	15–20
Uptake temperature, deg. F.	415	740	400–750

While the efficiencies on test range from 77 per cent at nominal rating down to 60 per cent at 350 per cent, the average operating economy is placed at about 70 per cent. Considering the wide and sudden variations in load and the character of the fuel, this performance is considered excellent. It may be compared to an average of 60 per cent for the older installation.

That considerably better results can be expected with a higher grade of fuel was indicated by four tests made at loads ranging from 200 to 275 per cent of rating with Harrisburg screenings of the analysis shown in the following table:

ANALYSIS OF HARRISBURG SCREENINGS

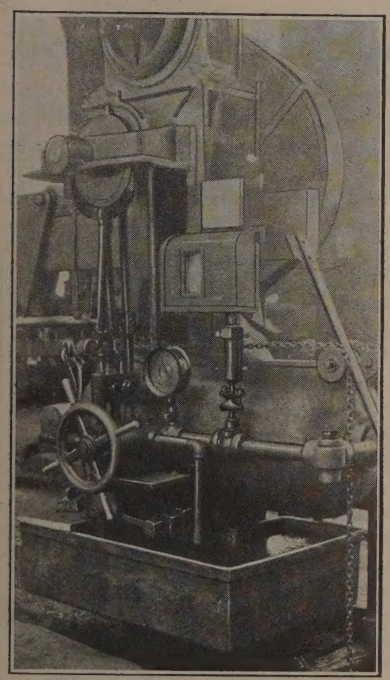
	Per Cent
Combustible	77.87
Moisture	9.90
Ash	12.23
Volatile—dry coal	29.48
Fixed carbon	54.11
Sulphur	2.81
Ash	13.60
B.t.u.—commercial, per pound	11,304
B.t.u.—dry coal	12,541
B.t.u.—combustible	14,514

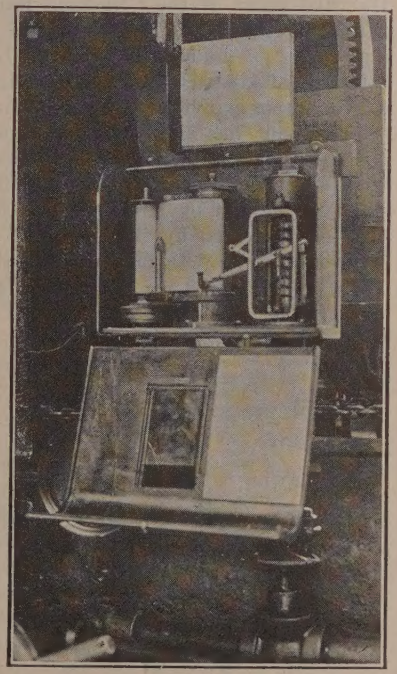
During the twelve tests no large clinkers were formed at any time, no slice-bar work was required on either side wall or bridge wall and no slag formed on the furnace walls or boiler tubes. The dumping periods were frequent and there was no appreciable drop in the percentage of CO_2 or in the steam flow. Such furnace conditions provide a unit of great flexibility peculiarly adapted to stand-by and to intermittent demands and to meet the most exacting requirements of railway and power loads. They also reduce the banking losses to the low figure of 250 lb. per boiler per hour.

Insuring Proper Wheel Mounting

HOW many electric railway men in whose shops wheels are being continually mounted have the assurance that the job is being properly done? P. V. C. See, superintendent of equipment Northern Ohio Traction & Light Company, Akron, Ohio, has learned by experience that the final pressure on the ram of a wheel press as shown by the gage is not a positive indication that sufficient contact pressure exists between the axle and the wheel to prevent its coming loose. To eliminate the uncertainty accompanying this work by knowing the value of the applied pressure during the whole operation of mounting a wheel, he has equipped his wheel press with an instrument working on the same principle as a steam engine indicator. The instrument, which is connected to the main oil feed line from the pump to the ram cylinder, is known as a hydraulagraph and is manufactured by the American Steam Gage & Valve Manufacturing Company, Boston. The hydraulic pressure acting on the ram operates the piston in the cylinder, which, in Fig. 1, will be noticed just beneath the instrument. This piston, moving against a spiral spring, actuates the pen gear which is attached to the piston rod through a system of levers. The chart is a continuous strip of paper, which is advanced from one spool to another by the movement of the ram itself. The connection to the instrument is made with a cable attached to the ram counterweight. Through the use of a ratchet device the chart is moved forward only during the working stroke of the ram and a reducing motion limits the chart advance each time to but a fraction of the ram travel. The result of the combined pen and chart motions is a diagram showing the curve of the pressure applied to the wheel with relation to the distance it has been pressed onto the axle.

The customary rule used in mounting wheels is to apply a final pressure of 10 tons per inch of axle diameter, assuming, of course that this pressure is built up uniformly during the mounting operation, that is, proportional to the area of the two surfaces in contact. Should either the axle be machined with a slight taper or the wheel bore be larger at one end than at the other, the required final pressure may be attained, not uniformly but rapidly during the last portion of the ram travel. In other words, a contact with the axle is not established along the total bore of the wheel, but only at the point of its minimum diameter. Such a fit is unsafe since a blow and not a sustained pressure is required to loosen the wheel. The curve showing the pressure cycle occurring during the mounting of a wheel when either

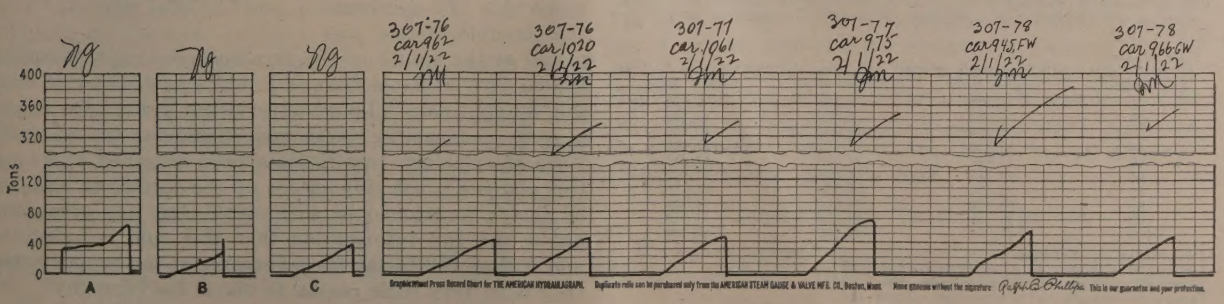




AT LEFT, A HYDRAULAGRAPH MOUNTED ON A WHEEL PRESS IN THE SHOPS OF THE NORTHERN OHIO TRACTION & LIGHT COMPANY

AT RIGHT, THE HYDRAULAGRAPH OPERATES ON THE SAME PRINCIPLE AS THE STEAM ENGINE INDICATOR

BELOW, TYPICAL SECTIONS FROM THE GRAPHIC WHEEL PRESS RECORD CHART



the axle surface or the wheel bore was tapered is marked *A* on the reproduction of a chart taken from the instrument. Curve *B* resulted from a case when the wheel-fit was too loose, the final pressure being caused by the wheel hub coming in contact with the axle shoulder. In such an instance there is insufficient contact pressure to permit the wheel and axle to be put in service. Curve *C* reveals a similar condition, that is, when the axle and wheel bore have uniform diameters but the fit is not tight enough.

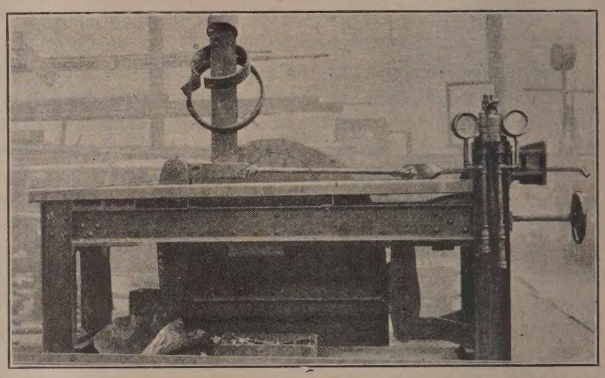
When this hydraulagraph was first installed the chart showed too many cases of faulty wheel mounting due to inaccurate machine work. The workmen now exercise more care in this respect, for they know that if there is a taper of more than 0.002 of an inch in the length of the axle seat or wheel bore the fit will be unsatisfactory. As the result of more accurate machining the chart for each wheel mounted now consistently shows straight lines terminating at approximately the proper pressure ordinate.

Above the curve for each operation the car and wheel numbers, date and name of the operator are recorded, and the chart is filed. Should trouble occur with any particular wheel, it is then possible easily to ascertain all the data concerning its mounting.

Tension Test for Brake Rods

WHEN the threads on the end of a brake rod have become worn or damaged it is the practice in the Harvard shops of the Cleveland Railway to cut off the threaded end of the rod and weld on a new piece of stock. After the repaired rod has been rethreaded, the strength of the weld is tested with the machine shown in the accompanying picture. The threaded end on which a nut has been screwed is held in a jaw while the clevis on the other end is pinned to a bar attached to the frame of the testing machine. Tension is applied to the rod by admitting air to a 10-in. cylinder, the force exerted by the piston of which being transmitted to the rod through a system of levers.

To accommodate the maximum testing stress to the size of the rod, three adjustments of lever ratios are provided. Since it is also possible to vary the tension by the amount of air admitted to the cylinder, a framed chart has been placed convenient to the operator, showing the pull exerted for each of the three lever ratios with values of the air cylinder pressure varying from 10 to 100 lb. per square inch. The maximum force that can be exerted by this machine is 68,500 lb., which occurs when the highest lever ratio is used and the full shop air line pressure of 100 lb. per square inch is admitted to the cylinder. The admission of air to the cylinder is controlled by an ordinary car brake valve, as seen in the illustration. The gage at the left shows the air cylinder pressure while the one at the right is connected to the air main.



GIVING WELDED BRAKE RODS A TENSION TEST BEFORE RETURNING THEM TO SERVICE, CLEVELAND RAILWAY

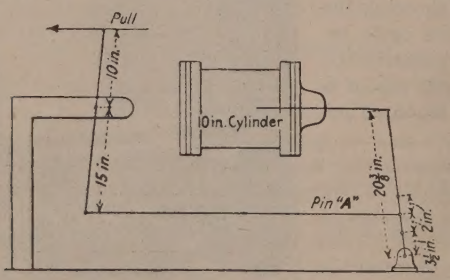


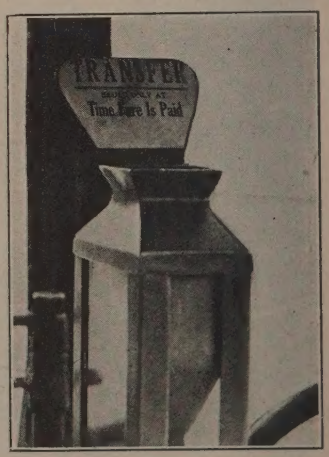
CHART WHICH SHOWS THE PULL EXERTED FOR DIFFERENT LEVER CONNECTIONS AND AIR CYLINDER PRESSURES

Air Pressure Lb. Per Sq.In. In Cylinder	Pull in pounds exerted with pin "A" in Holes as Follows Upper Hole	Middle Hole	Lower Hole
10	3,190	4,350	6,850
20	6,380	8,700	13,700
30	9,570	13,050	20,550
40	12,760	17,400	27,400
50	15,950	21,750	34,250
60	19,140	26,100	41,100
70	22,330	30,450	47,950
80	25,520	34,800	54,800
90	28,710	39,150	61,650
100	31,900	43,500	68,500

Area of cylinder 78.5 sq.in.
Lever ratio with pin "A" in upper hole—1 to 4.075
Lever ratio with pin "A" in middle hole—1 to 5.555
Lever ratio with pin "A" in lower hole—1 to 8.732

Transfers Issued Only When Fare Is Paid in Fort Wayne

SINCE the weekly pass system has been in effect on the Fort Wayne city lines, it has been found necessary to issue transfers only at the time fare is paid. For the past several years patrons have had the privilege of obtaining transfers at almost any time. However, with the advent of the weekly pass, this system had to be done away with for the reason that the operator is not able to tell after a patron had passed him whether fare had been deposited in the fare box or pass used.



TRANSFER NOTICE OVER FARE BOX

On account of the order issued to operators not to issue transfer after patron had passed the fare box, a great many complaints were received. To overcome this trouble, notice was placed at the mouth of the fare box reading, "Transfer Issued Only at Time Fare Is Paid." In addition to this the company ran full-page advertising in the local newspapers, also pasting these advertisements in the cars. Very satisfactory results have been obtained by using this plan, as it not only speeds up the service on account of delays occasioned by arguments, but has given the public the full information that this rule is inflexible and if they fail to ask for a transfer at the proper time, they have very little reason to blame the company.

How Resistance Is Used in Railway Automatic Substations*

An Engineering Analysis of the Numerous Conditions Which Affect Selection of Details of Equipment for Automatic Control of Substations —The Statements Are Based Upon Extended Experience in This Field

By C. A. Butcher

General Engineering Department,
Westinghouse Electric & Manufacturing Company

In THE *Electric Railway Journal* of June 24 there were published several statements from electrical engineers on the subject stated in the title of this article. There is apparently considerable difference of opinion as to how the resistors should be employed, but a study of these statements, together with personal knowledge of many of the systems with which these men are connected, leads me to believe that there are no real differences among them other than the differences in point of view.

Current-limiting resistors have been used with both synchronous converters and motor-generators, but they are essential with converters. An over-current regulator operating in connection with an electrically-operated field rheostat to reduce the voltage of a direct-current generator is often superior to series resistors as a means of limiting the generator load and is the most frequently used. Since the inherent characteristics of a synchronous converter do not permit of field regulation for load-limiting purposes, series resistors are necessary. Several schemes, however, require considerably less resistance than others and, in addition, have other desirable features in some applications. These are discussed in the following paragraphs.

Resistors for Use with Compound-Wound Converters

When compound-wound converters are used, resistors of ohmic value sufficient to limit the current to 50 per cent overload are used. The arrangement is such that these resistors are normally shunted by three contactors which open consecutively, as determined by the action of overload relays. In other words, the bus voltage is given a drooping characteristic on excessive overload. The regulation is in three steps, the bus voltage being reduced by an amount equal to the drop across the resistors in circuit.

In small stations, as in interurban service, where more than one feeder leaves the station, it has been customary to have two steps of resistors between the machine and the bus, and one in each feeder circuit. In large metropolitan stations, three steps have been generally used because of the larger number of feeders which are usually supplied.

The resistance values of each of the first two steps to be cut into circuit when the load is supplied partially from another source are determined, in the final analysis, by the fixed resistance of the circuit between the two sources of supply, each step being seldom more than half this value and often much less. These two steps provide regulation on overload by dropping the effective station voltage sufficiently to cause other stations to take more of the load. The third step of resistance is for current-limiting purposes and is usually cut into circuit only on short circuit. Following a total system outage, in locations where automatic stations are but a small portion of the total capacity supplying a given load, the automatic stations will be the first to resume service, and until other equipment is restored to service, the load may be of short circuit proportions in which case the automatic stations would operate with all resistance in circuit.

The thermal capacity of the third step, then, should be sufficient to allow for the normal time required to restore service. The thermal capacity of the first two steps is usually such as to give a longer time, dependent on the character of the load supplied. In interurban service, where only infrequent load swings are had, little thermal capacity is required. It is customary to allow five to ten minutes at 50 per cent overload for resistors to reach a temperature which will cause the operation of the protective thermostat. In metropolitan stations, it may be necessary to operate for the greater portion of an hour with one or two steps of resistance in circuit. It is, therefore, desirable to insure practically continuous capacity for these resistors.

Less Resistance Needed with Shunt-Wound Converters

If shunt-wound converters are used, only one step of current-limiting resistance, together with its shunting contactor, is used for each unit to provide against very severe overloads. Normally the inherent voltage droop of the machine is sufficient to prevent overloading beyond the short-time overload capacity of the unit. The drooping characteristic of the shunt machine may be compared with that of the compound-wound machine and a series limiting resistance shunted by contactors in an infinite number of steps, so controlled as to increase the value of effective resistance, to prevent increase in load above a predetermined maximum.

Experience has shown that under some load conditions in metropolitan service, the insertion of limiting resistance produces sufficient drop in bus voltage to cause the dropping of an excess amount of load, with the result that the load controlling relays operate immediately to reclose the resistance shunting contactors. The operation is rapidly repeated, thereby producing "pumping."

From the very low resistance between stations in a metropolitan system, it is obvious that a drop of a very few volts at the bus in one station may cause the transfer of enough load to other stations to overload them in turn. Thus there may be set up a condition of "pumping" of the load back and forth beween stations. Such condition is impossible with shunt-wound machines, each of which at all times, due to the drooping characteristic, tends to shed the load.

Economics of Trolley Voltage

It may be argued that low voltage is not desirable at increase in load. However, in congested areas where

*See also articles in the issues of this paper for June 24, 1922, page 997, and Aug. 5, 1922, page 199.

traffic conditions govern schedule speeds, high, or even what is usually considered normal trolley voltage cannot be economically utilized. Voltage higher than that required to maintain the schedule speed gives rise to increased rheostatic losses on the car in proportion to the excess voltage. During the peak load, when traffic is most congested, this gives rise to increased demand to the extent of the increased losses. Therefore not only are losses increased but, where power is purchased on the basis of demand, the demand charge is also excessive to the extent of the increased losses. Therefore the lowering of the voltage with an increase in the load at stations in areas of congested traffic is a decided economic advantage.

This truth has been very definitely established in cities where the bus voltage at such stations has been reduced during peak loads. During light-load periods, when the load on the machines in operation is light, schedule speeds are not, to the same extent, limited by conditions of traffic and are more nearly a function of the trolley voltage. Therefore, the higher voltages at the lighter loads may be desirable. To operate economically, however, the converters in service should be loaded as nearly as possible to the point of maximum efficiency, which is usually about full load. Such operation will quite definitely maintain the bus voltage at an approximately constant value.

Low Transformer Reactance Used with Shunt-Wound Converters

It is customary to operate converters with a field strength such as will give unity power factor at average load. With this arrangement, a compound-wound converter will operate at lagging power factor below this load and at leading power factor above it. A shunt converter operates in a reverse manner, with leading power factor at the lighter and lagging at the heavier loads. Therefore, there would be the same approximate resultant heating of the armature tap coils in either type. If transformers of 15 per cent reactance were used with a shunt machine, the variation of voltage would probably be excessive; therefore, transformers of approximately 7 per cent are used to give about 5 per cent regulation of the direct-current voltage.

Voltage Might Be Graduated by Zones

Since trolley voltage above what is actually required to maintain schedules gives rise to increased losses and excessive power demand it would seem advisable to operate stations supplying congested areas at lower voltage. Within certain limits it may be practicable to do this. For example, stations in an inner ring might be operated at 500 volts, those in an intermediate ring at 550 volts and those in an outer ring at 600 volts. Such a scheme could be worked out only where all stations are small and supply power to areas in which all cars move at about the same schedule speed.

Where large multiple-unit substations are feeding relatively large areas in which cars are moving at different schedule speeds, as obtains on the different parts of a line which passes from a congested area into an area where free open running is possible, such a scheme is not practicable unless the station is being operated with a sectionalized direct-current bus with each section at a different voltage. This arrangement requires careful sectionalizing of the trolley system, and increases the number of feeders and the total copper required. It also has the disadvantage that greater converter capacity may be required because advantage is not taken of the diversity factor of the total station load.

It may be more practical and economical to permit of feeder drop to the congested areas such as will give more nearly the economic average trolley voltage. This simply means that the losses would be partly transferred from rheostatic losses on the cars to losses in the feeders. Offsetting the increased feeder losses would be lower fixed charges because of the reduced investment in copper.

Several Types of Feeder Control Are In Use

Of the various types of feeder control equipment in use, each type has its adherents. However, each one has its own particular field of application.

The current-limiting resistance type of feeder, was applied until very recently almost exclusively to automatic substations regardless of capacity or the class of load supplied. For stations supplying power for interurban service, the application is quite satisfactory when the number of cars or trains on a given feeder are seldom more than two, but in a great many cases it is unnecessary.

Where converters are subjected to infrequent but heavy swinging loads, such as may be due to the acceleration of heavy trains, the resistors in series with the feeder, together with resistors in the machine circuit, by limiting the current to be commutated, will enable small converters to handle service which otherwise would require larger machines. The only argument for a resistor in the feeder is that it will, under some conditions, be sufficient to hold the load below the value at which resistors would be cut in between the machine and the feeder bus and thereby prevent penalizing other feeders supplied from the same bus with the consequently lower voltage.

When the resistance per mile of track is relatively high, the feeder-limiting resistor added to the circuit resistance of a grounded trolley may be sufficient to hold the current below the point at which machine-circuit resistors would be cut into circuit. In this case, a line car could move to within a short distance of the break and less time would be required to make repairs. At the same time normal service would be operated on other feeders.

On the other hand, if the fault occurs near the station the total resistance in circuit, including the current-limiting feeder resistor, will not suffice to limit the machine current to a safe value and part or all of the resistance between the machine and the bus will be cut into circuit. Should the short circuit not be burned clear, the resistors will overheat, with the result that the station will be shut down by the functioning of the resistor thermostat. Then when the grids cool the station will again automatically start, only quickly to shut down again if the short circuit condition persists.

Dependent then upon the thermal capacity of the resistors, the stations will start up and shut down periodically until the short circuit is cleared, penalizing all feeders supplied from the station. Not only are they deprived of a source of power, but if supplied from other stations they will be loaded excessively by feeding back into the "short" through the feeder bus.

To a great extent, this condition may be prevented by

making the feeder resistor of considerably less thermal capacity than the machine resistors so that it will reach a temperature that will cause the feeder isolating switch to open before the station is shut down. The station then, relieved of the short-circuit load, will resume normal operation on other feeders. However, if the aggregate load on other feeders is heavy, the total load on the machine resistors with a short circuit on the one may be sufficient to overheat the machine resistors and thus shut the station down as described.

How Many Resistors Will It Pay to Install?

With but few feeders, as are usually found in interurban substations, it is not difficult to arrange the resistance values and the thermal capacity of feeder resistors so that satisfactory operation will result. The question becomes one of economics: How much capital shall be invested in a lot of highly inactive cast iron, together with the switching required for it? If for example a 500-kw. machine can, by the use of resistance, be made to handle the work of a much larger machine, considerable investment is no doubt justified. If not, it is of doubtful value.

Function of the Automatically Reclosing Breaker

In small stations, supplying light interurban passenger service, an automatic, service-restoring contactor is inexpensive and is highly satisfactory. With such equipment, no current-limiting resistors are used. The contactor opens on overload and recloses automatically by the functioning of a relay in a Wheatstone bridge circuit set up to function when the resistance of the external circuit has increased to a value above a predetermined minimum. To permit the trolley to be sectionalized at the substation, similar equipment is supplied for each feeder circuit.

In case of a grounded trolley break, a line car may not be able to proceed towards it past the substation, as may be done under some circumstances with the resistance type of feeder. This is also true, however, where manually operated substations equipped with standard devices supply power to the system.

A feeder breaker in a small interurban station, out on a "short," is usually out to stay until the "short" has been cleared mechanically. The delay time on the train sheet chargeable to trolley breaks will not be increased by the use of the service-restoring contactor, and should show a decrease because of the fact that service is restored immediately after the circuit is cleared.

Where all manual equipment is used, the station operator must be notified to close the breaker. The time required for this depends on the available telephone facilities. In view of the fact that the man clearing the "short" has walked some distance to reach it, several minutes may elapse before he can hook up a portable telephone, get in touch with the operator and have a breaker closed. Even with the resistance type of feeder equipment, several minutes may be required for the resistors to cool before the contacts of the thermostat will operate to restore service.

Capacious Machine Resistors Sometimes Necessary

In large metropolitan stations, from which radiate relatively large numbers of feeders, the aggregate load in actual service will often reach values such as to bring current-limiting resistors into the machine circuit when the load on any one feeder is not sufficiently heavy to cut in a feeder resistor. Should a given station be overloaded due to an outage on one or more adjacent stations, it may be shut down by overheated machine resistors without a single feeder resistor having been cut into circuit. Such a condition can be prevented only by installing machine resistors with thermal capacity sufficient for continuous operation. The number of resistors required to do this is indeed a large item of expense.

Considering a metropolitan 600-volt railway distribution system, the effective total resistance between substations is very much smaller than the resistance between stations on an interurban system. The load is also more uniformly distributed between metropolitan stations than between interurban stations. Because of the low resistance between stations (0.03 to 0.06 ohm), a drop of a few volts at one station will result in the dropping of a large part of the load. Therefore, feeder resistors for metropolitan service must be of low ohmic value and are consequently of little value in limiting current in the event of short circuit. The application is therefore not practicable. Experience has shown that some other method of feeder control is required for this class of service.

Continuity of Service Is Frequently Essential

Under other than short-circuit conditions and often regardless of a short circuit it is highly desirable to stick to the load. In most cases, it is desirable to open the feeder only when a "short" occurs. If the feeder is carrying a legitimate load, even though abnormally heavy, such as one due to a congestion of cars, it is desirable to maintain voltage as nearly normal as possible to assist in clearing the congestion with minimum delay.

It is not desirable to delay the movement, as is done when voltage is reduced. Such, however, is done when current-limiting resistors are inserted in the circuit. Congestion on one feeder is usually the result of blockade involving several different lines so that simultaneously with the overloading of one feeder, other feeders from the station are at less than normal load. The station then is probably pulling the same total or even less than normal load. For the short time only that usually is required, the feeder circuit will safely carry the current necessary to clear the traffic.

A type of feeder equipment now very popular and applied quite generally in metropolitan service, differentiates between true overload and short circuit. A legitimate overload, regardless of value, will not open the circuit unless the cable reaches an excessive temperature. A thermal relay then operates to open the feeder and lock it out of service. It must be understood that the current limiting features in the machine circuits are retained even when this type of feeder is used. The rapid rise in current of a short circuit produces a voltage "kick" in a small series transformer which operates an instantaneous relay, and thereby causes the opening of the feeder circuit contactor or breaker. Normal changes of load do not cause a sufficiently rapid rate of change in current to produce voltage sufficient to operate the tripping relay. The reclosing of the feeder contactor is dependent on the action of a relay in a Wheatstone bridge circuit set up to measure the resistance of the external circuit. When the short has cleared or the resistance has increased sufficiently to limit the load to a predetermined value, the feeder circuit is automatically re-established. In the case of tie

feeder circuits, i.e., feeders with more than one source of supply, the feeder contactor in each station will reclose immediately upon the energizing of the feeder from any point, provided, of course, that the short circuit has cleared. This type of feeder equipment will close from voltage applied either to the feeder or the feeder bus. The feeder bus in any station therefore continues to act as an equalizer regardless of whether or not the machines in the station are out of service or fail to resume service following a total interruption of service or any disturbance which might so reduce the bus voltage in an idle station to a value which would cause all feeder switches to drop open. The feeder bus once energized by the closing of a feeder circuit, permits the closing of all stub-end feeders.

A feeder circuit designed for an average voltage drop of 10 per cent will have a maximum drop of 20, so that the least probable value of short circuit would be five times normal. It is therefore evident that the picking up of legitimate loads of normal or even excessive value will not produce a voltage "kick" in the tripping relay sufficient to cause the feeder circuit to be reopened. Since the operation is against short circuit and not overload, it is obvious that the breaker will rarely open. The reclosing system is rugged and sensitive; permitting adjustment for reclosing at very low values of resistance. Numerous applications of feeder equipment of this type covering a period of a year have been highly satisfactory.

Substations equipped with this type of feeder which immediately isolates shorted feeder circuits do not require as many steps of current limiting resistors between the machine and the bus. There is little probability of a traffic congestion within the feeding radius of a given station such as to give rise to a load of short circuit proportions, and it is therefore unnecessary to provide resistance to limit the current, as on short circuit, to the two-hour machine rating. With compound converters, two steps, each producing a drop sufficient to transfer a given portion of load to adjacent stations, are entirely adequate. For satisfactory operation, these steps should have thermal capacity calculated to give practically continuous operation under 50 per cent overload. The standard temperature relays, which follow very closely the time temperature characteristic of the machine, prevent damage to the machines from overheating by taking them out of service until they have cooled to a safe operating temperature. With shunt converters only a single step of resistance is required.

A modification of the short circuit selective feeder equipment eliminates the Wheatstone bridge reclosing feature and provides means for burning the "short" clear. This feature is described in the following paragraphs. Many operators feel that trouble crews can so quickly reach and clear a trolley break that the expense of burning off the short is not justified.

Supervisory Remote Control Needed

Experience in the operation of automatic substations in metropolitan service has shown the necessity of some form of supervisory control. One system worked out and in process of installation provides facilities at a central dispatch point for the supervisory control of all machines and both a.c. and d.c. feeders at each substation. This control is superimposed on full automatic equipment so that independently of the supervisory system, all functions are automatic. The devices are those used in the highly developed schemes of machine telephone switching. A modification of the automatic service "restoring short" circuit selective feeder equipment is used in these stations.

To illustrate the operation, assume that a d.c. feeder opens due to short circuit. The operation is indicated to the load dispatcher by the lighting of a small lamp on a control board very similar to that used in a central telephone exchange. In this particular application, the lighting of the lamp indicates that the particular feeder has been transferred to an auxiliary bus. By a selective switching arrangement, the load dispatcher may transfer other feeders which are supplied from other stations to the auxiliary bus. The flow of current to the shorted feeder thus limited by the resistance of the tie feeders will usually burn off the "short" with minimum disturbance to operation. As soon as the "short" has cleared, the feeder is automatically reconnected to the main bus. As before, the operation is indicated to the dispatcher who then proceeds again by means of selective switching to restore the other feeders to the main bus.

In a similar manner, any machine may be started or stopped and any high-tension circuit breaker opened or closed. Inspection of the indicating panel in the load dispatcher's desk gives a visible indication of the operating status of each machine and feeder circuit. In addition to such indications, the load dispatcher has before him a continuous indicating and graphic record of the total load in amperes at each station. This is by a system of remote meter indication. But two pairs of ordinary telephone leads are used between each station and the central dispatch point.

Obviously, a simplification of this scheme is all that need be applied to the average system. Several very simple schemes of a similar nature are in process of manufacture for application to the control of automatic hydro-electric generating stations. Over a single pair of telephone leads, a dispatcher receives audible signal of any unusual operation. By dialing a given number on an ordinary subscriber's automatic telephone set, a selector is set into operation at the substation. This selector, by audible code signals, picks out, for example, the feeder which has opened or similarly indicates any other abnormal operation. By proper dialing, the load dispatcher has complete supervision of the automatic station. Such a system permits of the proper operation of the substation equipment to meet almost any operating emergency.

Automatic switching must be applied to meet service requirements. Since these requirements are not standard, no standard control can be adopted and the details can be determined only after a study is made of the requirements of each application.

New Line of Multi-Speed A.C. Motors

THE Mechanical Appliance Company of Milwaukee, Wis., is marketing a new line of multi-speed a.c. motors which provide for speeds of 600, 720, 900, and 1,200 r.p.m. These motors are of the squirrel-cage type, and are rated on a 40-deg. basis—that is, they will carry full load indefinitely without exceeding 40 deg. They will carry 25 per cent overload for two hours, with a temperature rise not exceeding 55 deg. C. These motors are particularly applicable to machine tool drives in shops provided with alternating current.

Super-Power Plant for Paris Region

IN ORDER to secure maximum fuel economy the power producing interests of Paris, France, have combined to supplant the present power generating facilities with those of the latest and best types. The great power plant discussed briefly in an article in the issue of the *Electric Railway Journal* for May 8, 1920, page 952, is now approaching completion. For the present it will contain five 40,000-kw. turbo-generator units, but will ultimately be extended to a total capacity of 320,000 kw. This plant is being built and will be operated by the Union d'Electricité, which is the successor of the Union Française d'Electricité, formed in 1919.

The steam pressure which will be used in the plant is 313 lb. gage, at the turbine throttle, where the superheat will be about 280 deg. F. One of the elements in securing economy in the plant has been the use of large boilers, so that five double-end and ten single-end boilers supply steam for 200,000 kw. The double-end boilers are of the Stirling type and they are equipped with Riley underfeed stokers. The grate surface of each double boiler is 660 sq.ft. The single-end boilers are of the B. & W. type. These are equipped with chain-grate stokers, and their grate area is 394 sq.ft. per boiler.

The superheater surface in the double-end boilers is slightly under one-half the heating surface, which is 22,600 sq.ft.; while in the single-end boilers it is much more than one-half, the heating surface in this case being 14,300 sq.ft. Economizers with heating surface slightly greater than the superheater surface are provided, and air preheaters are used to extract part of the heat from the flue gases for the purpose of warming the air entering the furnaces.

The boilers are guaranteed to deliver 5.85 lb. and 6.15 lb. of steam per hour per square foot of heating surface for the double-end and single-end types respectively.

The turbo-generator units are rated at 40,000 kw. on the basis of maximum continuous load. They operate at 1,500 r.p.m. and produce 50-cycle three-phase current at a terminal voltage of 6,000.

On account of the high pressure and temperature of the steam the water rate of the turbine is low, the guaranteed steam consumption at each of several loads being as follows: 40,000 kw., 9.62 lb. per kilowatt-hour; 30,000 kw., 9.46 lb.; 20,000 kw., 9.9 lb., and 10,000 kw., 11.0 lb.

The generators will be cooled by means of a closed air system, with coolers located in the foundation.

The turbines are of the Zoelly impulse type, single cylinder and single flow. They contain but ten pressure stages in the expansion, an unusual feature in turbines of this size, at least from the standpoint of the American designers. High pressure steam is admitted into the second stage above 30,000 kw., the admission valves being operated automatically. Provision is also made for bleeding steam from the seventh and eighth stages for feed-water heating, a factor in maintaining the heat balance of the plant.

In addition to the use of large units and high-pressure, high-temperature steam, every effort is made in this plant to recover the lost heat.

Mention has already been made of the economizers and preheaters. The economizers form one part of the equipment for heating feed water. In addition the condensate is used in part for cooling the generator ventilating air, thus absorbing waste heat. The exhaust from the steam-driven boiler feed pumps also yields heat to the condensate, which is also used for cooling the generator bearings. In addition the feed water is heated still further by means of steam bled from the turbine, as already mentioned.

The Gennevilliers plant is well located as to fuel supply, being on the bank of the Seine and contiguous to the Paris-Havre Railway. Coal received on barges or railroad cars can be stored in a 60,000-ton yard lying along the river, or it can be delivered directly to a coal-handling equipment which will crush and elevate it, distributing it to the overhead bunkers. The bunker distribution is by means of a monorail system, with an elaborate sectionalizing and block-signal arrangement, by means of which 6-ton traveling hoppers can be dispatched with great facility. These hoppers are driven by two electric motors each, and current is taken from a trolley wire at 500 volts.

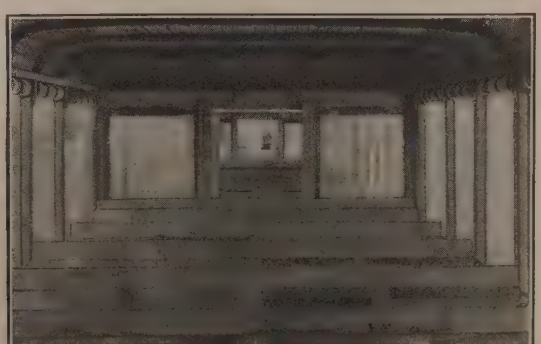
Eighty-five Passengers on Gasoline Train

A GASOLINE "summer train" of the two-car type, manufactured by the Four Wheel Drive Auto Company, Clintonville, Wis., has just been completed. The cars are of the open type with adjustable curtains along the sides to provide protection for passengers against sun or rain.

The forward car of this unit has a seating capacity of thirty-five persons, and the rear car can accommodate fifty. Each seat provides room for five grown persons.

The cars are equipped with air brakes, electric starting device and horn, standard M. C. B. couplers, locomotive type "cow catcher" on the forward car, sanders for sanding the rails, and high-speed reverse gear which enables the cars to go as fast in reverse as forward.

During the test runs this equipment has attained a speed of between 35 and 40 m.p.h. The cars have rounded curves up to 16 deg. curvature at a speed of 25 m.p.h. without the least trouble, and can round much sharper curves at a reduced speed.



SUMMER TRAIN PROPELLED BY GASOLINE POWER. AT RIGHT, INTERIOR OF OPEN TYPE CARS. CROSS SEATS HOLD FIVE GROWN PERSONS

The Boston Elevated Railway—Four Years Under Public Control

This Review Takes Up by Years the Financial and Operating Results of the Trustee Plan—Much Has Been Done to Improve the Service and Rehabilitate the Property, Which for the First Time in 11½ Years Has No Notes in the Banks

BY EDWARD DANA
General Manager Boston Elevated Railway

IN THE February, 1921, issue of the *National Municipal Review* there appeared a paper read by Mr. Jackson, chairman of the Board of Trustees of the Boston Elevated Railway, at Indianapolis on Nov. 17 and 19, 1920, outlining the public trustee plan in Boston (created by Chap. 159 of the Special Acts of the Legislature of Massachusetts of 1918 known as "The Public Control Act."* On June 30, 1922, four years of public control had elapsed.

In attempting to outline the situation at the close of these four years, it seems appropriate to make reference to facts and conditions and permit individual conclusions to be drawn from them.

COMPARATIVE DIVISION OF RECEIPTS AND EXPENDITURES FOR THE YEARS ENDING JUNE 30, BOSTON ELEVATED RAILWAY

Note: Figures given are to the nearest dollar.

	1922	1921	1920	1919	1918	1917	1916	1915	1914	1913
Total receipts	$32,781,493	$34,224,150	$32,689,201	$25,223,496	$19,480,022	$19,788,953	$18,781,328	$17,886,550	$17,785,978	$16,968,328
Operating expenses										
Wages	$14,920,406	$16,753,668	$16,381,207	$13,554,684	$9,147,757	$9,033,868	$8,351,118	$7,709,374	$7,247,065	$6,552,208
Material, supplies and other items	3,056,521	2,899,984	3,321,672	4,096,538	2,680,424	1,951,176	1,921,083	1,922,623	2,441,049	3,014,655
Injuries and damages	476,844	627,629	627,626	805,353	817,227	819,706	762,352	722,177	751,332	750,041
Depreciation	2,004,000	2,004,000	2,004,000	2,004,000	352,670	330,000	220,000	62,990	.....	.....
Fuel	1,656,013	2,399,277	1,996,717	1,901,597	1,381,957	947,413	825,444	870,820	858,416	818,677
Total operating expenses	$22,113,784	$24,684,558	$24,331,222	$22,362,172	$14,380,035	$13,082,163	$12,079,996	$11,287,983	$11,297,861	$11,135,581
Taxes	$1,610,096	$1,306,736	$1,075,497	$941,611	$905,033	$984,071	$1,043,042	$1,069,189	$1,040,947	$1,128,022
Rent of leased roads	2,549,625	2,673,167	2,607,566	2,587,130	2,547,421	2,428,512	2,395,804	2,325,289	2,264,201	2,221,287
Subway and tunnel rents	1,974,141	1,947,963	1,591,324	1,492,000	991,551	995,093	915,192	825,496	677,900	687,309
Interest on B. E. bonds and notes	1,483,787	1,483,626	1,593,258	1,423,142	1,238,374	1,138,656	1,129,678	1,049,785	1,067,900	1,095,507
Miscellaneous items	58,476	54,479	69,285	37,373	16,050	9,525	13,846	4,588	.....	.....
Dividends	1,606,372	1,523,367	1,403,970	1,360,220	.....	1,193,970	1,193,970	1,313,367	1,193,970	1,197,000
Total cost of service	$31,396,282	$33,673,896	$32,672,121	$30,203,647	$20,078,464	$19,831,990	$18,771,528	$17,875,698	$17,542,780	$17,464,705
Loss or gain	$1,385,211	$550,254	$17,080	*$4,980,152*	*$598,442*	*$43,037*	$9,798	$10,852	$243,199	*$496.377*
Back pay applying to May and June, 1919, but paid in October, 1919	.....	.....	.....	*435,348*	.....	.....	.....	.....	.....	.....
				$5,415,500						

The paper of Mr. Jackson outlined the functioning of the act, and it is assumed that the method devised in Boston under the Massachusetts plan is consequently understood. In order therefore to visualize the operation of this public utility, it seems wise to call attention to the statistics showing revenues and expenditures by years since 1910 and from them to point out salient features and then explain what is actually going on at the present time.

In the first instance from 1910 to June 30, 1918, the fare had remained at 5 cents and the gross revenue during these nine years had increased from $15,250,000 to $19,500,000. Operating expenses had increased from $10,000,000 to $14,250,000, the chief factors being the gradual increase of the payroll and the increased cost of fuel. During these years the allowance for renewals or depreciation had been insufficient and also during this period in order to hold the 5-cent fare in face of increased operating expenses and other fixed charges, adequate current maintenance had not been provided. Under these circumstances, with less maintenance than was required by the property, with insufficient renewals and with the passing of the dividends completely for the year, the year ending June 30, 1918 showed an operating deficit of $598,442.

It was these facts which resulted in the experiment with public control beginning July 1, 1918, under the service-at-cost plan, which is based on sound economic principles. It was designed to put an end to the downhill flight which had been going on unceasingly, as new subways had been added which increased the charges on the car rider and as operating expenses steadily increased, notwithstanding insufficient provision for maintenance and renewals.

The first year of public operation under the provisions of the act required an increase in fares. At the same time substantial increases in wages and cost of materials, supplies and fuel were occasioned by war conditions, with the result shown in the tabulation of an actual deficit of $5,415,500.

During the first year it was necessary under the act to use the reserve fund of $1,000,000 created under the act and to assess the cities and towns in the district served $3,980,151, in order to provide sufficient funds to meet the cost of service during that year.

During the second trustee year it was necessary to go to a flat 10-cent fare on the entire system in order to keep pace with the rise of wages and costs during these troubled times. At the end of the second year receipts exceeded cost of service by $17,079 which was transformed to a deficit by a retroactive wage award in July, 1920.

During the third year which ended June 30, 1921, operating expenses reached the maximum of $24,684,558, including for wages the maximum of $16,753,657. Subway rentals likewise had increased from $559,000 in 1910 to approximately $2,000,000 in 1921. Wages

*An abstract of Mr. Jackson's paper was published in the *Electric Railway Journal* for Dec. 4, 1920, page 1141.

had been further increased by arbitration in July, 1920. Yet the efforts made by the entire operating organization resulted in meeting the situation without departing from the 10-cent fare and holding the operating expenses to an increase of approximately $350,000 over the second year in the face of an estimated increase in wages, cost of materials and supplies of more than $3,000,000. The receipts during the third year exceeded the cost of service by $550,253.52 and permitted restoration of $131,985.01 to the reserve fund after payment of the second year's deficit.

The fourth trustee year has just closed and a different state of conditions is apparent. After meeting all costs of service, there remained a balance of $1,385,211.44. This balance, plus the $131,985 of the third year, has been applied in restoring the reserve fund to its original total of $1,000,000 and in making the first payment of $517,196.45 to the State for distribution to the cities and towns that contributed to the loan assessment in 1919. Operating expenses had been reduced from $24,684,000 to $22,113,000, and the payroll had been reduced from $16,753,000 to $14,920,000. This result was brought about not by radical cuts in wage rates but rather by the introduction of more efficient methods of operation and the co-operative efforts of the entire organization, together with reasonable reduction in rates.

COMPARATIVE DIVISION OF RECEIPTS AND EXPENDITURES FOR THE YEARS ENDING JUNE 30, BOSTON ELEVATED RAILWAY

Note: Figures given are to the nearest dollar

	1912	1911	1910
Total receipts	$16,522,542	$15,980,708	$15,245,865
Operating expenses			
Wages	$6,132,256	$6,098,711	$5,910,768
Material, supplies and other items	3,242,424	2,488,667	2,376,034
Injuries and damages	797,436	694,559	776,588
Depreciation	.....	.....	200,000
Fuel	804,519	837,128	822,498
Total operating expenses	$10,976,634	$10,119,064	$10,085,877
Taxes	$1,221,756	$1,244,833	$1,213,089
Rent of leased roads	2,178,523	2,143,263	2,028,165
Subway and tunnel rents	603,226	567,087	559,469
Interest on B. E. bonds and notes	837,033	556,000	556,000
Miscellaneous items	.....	.....	.....
Dividends	1,197,000	1,197,000	1,002,003
Total cost of service	$17,014,174	$15,827,247	$15,444,604
Loss or gain	*$491 632*	$153,461	*$198,734*

It should be noted that the gross revenue fell from $34,224,000 in the third year to $32,781,000 in the year just closed. The Board of Public Trustees had inaugurated a system of local 5-cent fares in conjunction with the flat 10-cent fare which at the present time results in 21 per cent of the total traffic being handled for 5 cents and which has restored millions of riders on short hauls who were lost on account of the introduction of the 10-cent fare. The average fare consequently at the present time is 8.95 cents.

The retention of the basic 10-cent fare has been necessary, however, in order to secure the gross revenue required to meet the cost of service which in 1922 amounted to $31,396,281. As contrasted with this the gross revenue during the year 1917, when 381,000,000 revenue passengers were carried at a universal 5-cent fare, amounted to only $19,788,953. It can readily be seen that any hope of meeting the cost of service with a universal 5-cent fare cannot be realized.

At the present time, with the joint 5-cent and 10-cent fare, passengers are being carried at the rate of 360,000,000 per year, which is considerably above the low point of 325,000,000 in 1919 and not far from the high point of the 381,000,000 previously referred to.

It may well be asked at this time as to what effect the Boston service-at-cost plan has on efficiency of operation, incentive for economical operation, freedom from political or other interference and spirit of service to the car rider.

In this respect it is believed much has been accomplished. Employees have been acquainted with the provisions of the act, with the intimate details of financial matters and the progress made from time to time in improving service and meeting the difficulties of operation. During this period, two decreases in compensation have been amicably adjusted between management and employees and a constant effort has been made to operate the property always in the interest of the car rider with the fewest men possible. The average number of men on the payrolls during the four trustee years has been as follows:

NUMBER OF MEN ON PAYROLL

1918-1919	9,748
1919-1920	10,021
1920-1921	9,264
1921-1922	8,915

Likewise it is of interest to note that the labor turnover has been reduced to a minimum, and in fact all platform men or car service employees have been in service four and one-half years or more, which necessarily results in benefit to the service. This compares with a former annual labor turnover of 55 per cent.

In this connection it has been possible to work out an eight-hour day as well as a guaranteed pay of eight hours for all platform men, with the result that whereas under the former conditions a large number of spare men were required, under the conditions existing today a much smaller number of spare men are required all of whom receive a full day's pay. The so-called spare men reporting each day represent 6.7 per cent of the total today as compared with 20 per cent previously.

Referring to the statistical table again it is interesting to note that the expense incurred on account of injuries and damages for the fourth trustee year was $476,844. Following back through thirteen years it will be noted this is the lowest of any of these years, yet vehicular congestion is greater and the movement of people on the highways greater than in previous years.

The total expense on account of injuries and damages including the cost of operating the Claim Department, trial of cases, etc., for the last trustee year amounted to $620,207.73 which represents 1.89 per cent of the gross revenue, the lowest ratio in the railway's history.

Much has been done in improving the service. Although the mileage operated last year (49,662,045) was less than any year back to 1905, the introduction of two and three-car train service and cars of larger carrying capacity with scientific rearrangement of schedules has provided additional service where needed and permitted the elimination of mileage where not required.

It is of interest to note that the number of revenue seat-miles per revenue passenger for the last year was 7.5 which for those acquainted with this figure as an index of service would indicate adequate service allowance by mileage operated only where required. At congested points more seats are provided than before while surplus seating capacity has been removed at points where it previously existed. This is the acme

of proper service and results in minimum cost to the car rider.

Under the act the Board of Trustees were charged with the responsibility of providing for proper maintenance. The percentage of total railway operating revenue applied to maintenance and depreciation consequently has been approximately 24 per cent, whereas previously the percentage of operating revenue applied to maintenance and depreciation had been 17 per cent. What has been accomplished with respect to car equipment is illustrated by a comparison of the number of disabled cars in 1918 and 1921 which shows a reduction of 68.7 per cent for surface cars and 53 per cent for rapid transit cars. The percentage of cars out of service in bad order has been reduced to 5 per cent. At the same time, through the operation of the renewal charge which has been conservatively adopted, it has been possible to replace much of the rolling stock which was unsatisfactory from the point of service to the car rider and expense to maintain. During the period of public operation 535 new cars have been placed in service and 140 additional cars are now on order.

A reasonable program of track reconstruction has been maintained and has resulted in improved operation, lessened the wear and tear on rolling stock, and reduced derailments.

The latest modern machinery has been employed in the construction of track in the interest of efficiency and economy. Recently it was found that the railway's own forces, due to organization and this machinery, were enabled to construct a section of track cheaper than the figures submitted for the work by contract on an advertised bid.

During the trustee year approximately 7 per cent of the track has been rebuilt as compared with an average of 2½ per cent for the previous six years, which means 22 miles of track as compared with 8.

The following newspaper quotation is of interest:

> By dint of good planning for the night use of electric cranes, air compressors and a concrete breaker with five 500-lb. teeth, the Elevated gave an admirable lesson in quick tracklaying on Boylston Street over the week end.

Much could be detailed in regard to improvements such as have been made in power plant equipment, signals, repair shops, motorizing horse-drawn equipment, development of modern carhouse yards, as well as the progress made upon the modern centralized mechanical repair shops now under way all vitally affecting the quality and quantity of service which can be rendered.

The railway today has more than $2,000,000 cash on deposit, $1,000,000 of which is in the reserve fund created under the Public Control Act. For the first time in eleven and one-half years the railway has no money borrowed from the banks. As contrasted with this there was a floating indebtedness in excess of five millions during the first trustee year.

Engine-Driven Welding Equipment Developed

AN ENGINE-DRIVEN welding equipment for use where electric power for motor drive is not available and for job welders who must work in widely scattered districts has been developed by the Westinghouse Electric & Manufacturing Company. This apparatus is made in stationary and portable models.

The equipment consists of a Westinghouse single-operator welding generator geared to a Doman four-cycle, two-cylinder, low-speed, marine-type gasoline engine. The generator is direct current, has a rated capacity of 175 amp., and a maximum capacity of 225 amp., at 1,750 r.p.m. The generator is designed to operate at arc voltage, and to inherently stabilize the arc and supply a substantially constant current of different values over the working range of 90 to 225 amp. The operating characteristics of the generator are such that it is unusually easy for the operator to strike and maintain the arc, and also to obtain the deep penetration and thorough fusion necessary for satisfactory welding. The shaft of the generator extends through the pedestal bearing and is connected by means of a flexible coupling to the exciter.

Portable Paint Spraying Apparatus

THE Northern Ohio Traction & Light Company is experimenting with the spraying process for painting poles. For this purpose a portable outfit has been assembled using an old automobile trailer, on which was mounted a few pieces of car equipment such as may be found in almost any electric railway shop.

PORTABLE COMPRESSOR FOR SPRAY PAINTING POLES

These parts comprise a 550-volt compressor, a governor and an air reservoir bolted to the trailer platform as shown in the illustration. The sprayer is connected to the reservoir through the usual reducing valve with a 50-ft length of automobile type air hose. Power to operate the sprayer is tapped from an outlet on one of the yard poles.

The practice followed has been to spray first the upper halves of all the poles as they were laid out in single tiers in the storage yard and then pike them all over to paint the remaining surface. So far this

POLES IN STORAGE CAN BE PAINTED WITH VERY LITTLE HANDLING

method has given promising results. One man, of course, can accomplish more in this way than several by hand, partly because the roughness of the surface has less effect on the speed of working with a sprayer than with a brush. Being portable, this outfit may also be used for painting poles already in place.

Letters to the Editors

Selecting Platform Men

BELFAST CITY TRAMWAYS
BELFAST, IRELAND, June 30, 1922.

To the Editors:

Articles on the selection and training of motormen, appearing in the various issues of the *Electric Railway Journal* from time to time, have greatly interested me. It is apparent that diverse views obtain on this subject, but all agree it is desirable to get the right type of men, that great discrimination has to be exercised in their selection and that, while operating conditions and types of men vary, the man selection problem is always with us.

One cannot always judge a man by his appearance; no man is infallible. Interviews register impressions, good, bad or indifferent. Later they help in determining whether one's judgment is at fault. Certain types of men are brilliant in an interview but not in car operation, and as the duties they have to perform are more of the specialist order, they cannot be sorted out into types, each type yielding the best results under particular treatment. That undertaking is fortunate indeed which has for its guiding hand one whose expert knowledge of human nature and sympathy with the problem fit him for the task.

On this system, a responsible department head interviews and engages all platform men, working upon a common sense system of his own, in sizing up men. By this means he comes into personal touch with every man, asks all questions and takes time to make the applicant feel that nothing has been left undone to give him a square deal. After the men have been trained, they are carefully followed up to see how they progress, also to show them that all interest in them is not lost as soon as they had passed into the service. It takes up time to interview men, but it is worth while in order to select the most suitable for the job. Having to discharge men as unsuitable is a very expensive matter, and it pays to take the time in selecting the right men.

All men in the service know that an easy channel of appeal is provided for them whenever decisions seem to be unfair.

That we have been successful in the care and selection of our platform men is shown by freedom from accident and damage suit claims. Whether this is due to the fact that the greater number of our men are country bred is an open question. My own personal experience is that country men who come into the city seeking employment are anxious to get into a settled occupation with steady wages, which are usually higher than they have been receiving, and once they get a start they will, as a rule, stick tenaciously. They are slower to pick up instructions, but, under tactful teaching and guidance will learn readily enough, are reasonable in their views as regards hours of labor and discipline, and whether in the shop or on the road are not afraid of work.

On the other hand, the town bred man is more used to selecting his own occupation and if he is not satisfied with the prevailing conditions, he soon shows it, does not worry about being discharged, and as often as not discharges himself and uses his friends to get work elsewhere. His knowledge of the city and places to apply for work enables him to please his own inclination. Consequently, his job for the time he is employed does not grip him in the same way.

Whatever type of platform man is selected, either from the country or town, the fact cannot be disguised that each year adds to his duties more exacting operating conditions, due to higher speeds, heavier cars, and denser traffic on the streets.

Bad driving does not necessarily proceed from incompetence on the part of the motorman. It is usually due to recklessness, over-confidence and lack of consideration for others. In fact, some men seem just as reckless as they dare be. This type of motorman cannot be discovered during his training period. He indulges in speed intoxication whenever the chance offers and only realizes that the road does not belong to him after he has had a bad smash.

While the points raised are the daily experience of all traction men, the only way we have of making contact is by absorbing the written results of each other's labors and perhaps there may be some one way trail leading us to the solution of our platform troubles and a formula written on how to select men to suit our various needs.

H. VERNON,
Rolling Stock Engineer.

Now San Francisco Adds Another Section To The Previous "57 Varieties"!

BROOKLYN RAPID TRANSIT SYSTEM
BROOKLYN, N. Y., Aug. 7, 1922.

To the Editors:

In the interest of standardization in general and of street railway rails in particular, some comments may not be out of place relative to the proposed 121-lb. 9-in. girder rail which is to be rolled for the Market Street Railway of San Francisco, mentioned in the issue of the *Journal* for July 29.

Our old friend, "Mr. Local Conditions" seems to have had his say to good effect in this instance and another rail section is to be added to the overburdened catalogs of rail sections, although there may be some small satisfaction in noting that the two fundamental principles of the A.E.R.E.A. standard 9-in. rail design are to be followed. These are the tapered web and the curved head. It is also noted that the joint plates are apparently of the type following the A.E.R.E.A. designs although the full advantage of the wide bearing area at the tops of the plates is not obtained with the new rail section, if your drawing is correct.

One feature of the article describing the new rail mentions the omission of the sloped back or bevel of the head and the relation of such a bevelled head to asphalt laid directly in contact with the rail heads. It may be of interest to state that the association standard 7-in. rail having this bevelled head has been in service in Brooklyn over five years in asphalt pavement laid directly in contact without developing any serious or special wear which can be ascribed to this feature of the standard rail design. Furthermore, perhaps 5 or 6 miles, measured as single track, are being laid in this manner in Brooklyn this year as the result of the experience with previous installations in modern track. Also, the rails here are carrying wheel treads $2\frac{1}{2}$ in. wide with $\frac{5}{8}$-in. deep flanges, and the wide head of the association standard is considered an advantage

when wheel treads become widened as they frequently do, after a reasonable period of wear.

In closing, it may be noted that rail manufacturers informally advise the writer that about 75 per cent of their orders for both 7-in. and 9-in. girder grooved rails, this year, have called for the Association Standard sections. So we may take heart in our efforts to standardization even though, here and there "local conditions" still have their say.

R. C. CRAM,
Engineer Surface Roadway.

The A. E. R. E. A. Standard Spirals and the Proposed Clearance Curves

THIRD AVENUE RAILWAY SYSTEM
NEW YORK, N. Y., Aug. 2, 1922.

To the Editors:

In your issue of July 15 there appeared an article by S. Striezheff, department of way and structures Brooklyn Rapid Transit System, entitled "Switch Easements and Frog Standardization."

The author seems able to find but little good in standardization in general and in the standards of the A. E. R. E. A. in particular. He quotes with apparent approval "a prominent American engineer" to the general effect that it was common practice in France to install "curves of plain radius and that the cars going over them would after a while work out a spiral for themselves at each end of curve."

In discussing the standard A. E. R. E. A. spirals the author makes a comparison between one of them and Lorain spiral No. 3 with 150-ft. radius switch, which he considers decidedly preferable.

Of course, 150-ft. radius switches and spirals made by the cars themselves are in use, but it is difficult to see how any progress toward standardization can be obtained if such practices are adhered to. The A. E. R. E. A. standards so far adopted have been worked out after an expenditure of much time and study by committees of engineers representing some of the largest of the street railway systems in the United States with the expert assistance of the designing engineers of the special trackwork manufacturers. The standing committees of the A. E. R. E. A. are steadily at work endeavoring to determine on such further standards as may prove practicable. It is believed that a sympathetic study of the standards already adopted by the association will make clear to the industry generally the value of adopting them, from the points of view both of efficiency and economy.

E. M. T. RYDER,
Way Engineer.

Paving Breakers Used to Demolish Building

THE Ingersoll-Rand Company, New York, N. Y., has given out information regarding the use of its CC-25 paving breakers for removing the side walls and top of a large venturi vault in a filtration plant in Cleveland, Ohio. Paving breakers have been used by electric railways in connection with the breaking up and removal of pavement and no doubt some electric railways may have occasion to use them also in connection with demolishing building construction. In the instance described, the paving breakers not only broke up the concrete into pieces with the aid of a cutting chisel they also cut off steel reinforcing rods. Walls 12 in. in thickness, 51 ft. long and 10 ft. high were removed in seven days. The roof of the vault was removed in three and a half days.

Railroad Traffic in New York City

Four Electrified Passenger Terminals Show Increasing Traffic—Flatbush Avenue Terminal of the Long Island Railroad Handles Largest Traffic of Any in This Country

IN CONNECTION with the studies made of the local transportation problem, and bearing upon the need of future provision for handling of suburban passengers within the city, the New York Transit Commission has collected figures which show the steam railroad and local ferry traffic to and from New York in 1921. These figures, based either upon actual counts or very careful estimates, show that the trunk railroads entering New York or approaching upon the New Jersey side carried a both-way passenger traffic of 220,847,049 in 1921. Of this number 148,958,292 were commuting, zone, trip ticket or reduced fare passengers, while 71,808,757 were regular fare passengers.

In addition, as indicated by the figures furnished to the commission, local passengers upon the ferries entering New York, exclusive of interborough ferries, and also excluding railroad passengers delivered to destination in this manner, were 52,621,220, a grand total of traffic in and out of New York by railroads and ferries of 273,468,269 during 1921. As this local ferry traffic is almost entirely commuting in character, it may be combined with the figure of railroad commuter traffic, showing a grand total of commuters in and out of New York of 201,579,512 for the year.

The total increase in railroad traffic for the year was 978,333, which is regarded as a very low figure, doubtless occasioned by the business slump, as both railroad and rapid transit traffic have been frequently observed to be indices of business conditions. The bread-line season of 1913-1914 exhibited the only actual falling off in trolley, subway and elevated travel which has occurred in New York in decades.

The railroad total, while it includes the electric lines of the trunk roads together with the electrically operated Westchester & Boston, does not include the traffic borne upon the Hudson & Manhattan Railroad, which last year carried 94,559,352 passengers; 59,221,354 to and from Hudson Terminal and 35,337,996 to and from uptown New York, an increase of 8,873,484 over 1920.

Traffic to and from the St. George terminal of the steam lines on Staten Island is also not included, as this is almost purely intercity travel, with only a few commuters from Perth Amboy, N. J. This traffic showed a falling off to 11,181,786 in 1921 from the 1920 figure of 13,011,958, a drop of 1,830,172.

The following tabulation presents a comparison of traffic upon the trunk lines to and from New York in the years 1920 and 1921:

PASSENGERS IN AND OUT OF VARIOUS STEAM RAILROAD TERMINALS IN NEW YORK CITY IN 1920 AND 1921

	1920	1921
Baltimore & Ohio	330,000	551,880
Central of New Jersey	18,136,928	16,718,099
Delaware, Lackawanna & Western	21,553,040	21,594,743
Erie	31,248,990	30,026,406
Lehigh Valley	460,000	529,706
Long Island	59,133,876	60,386,698
New Haven	16,952,093	16,653,438
New York Central	28,717,270	28,434,974
Ontario & Western	634,132	619,658
Westchester & Boston	4,442,012	5,395,365
Pennsylvania	38,260,435	39,936,082
Totals	219,868,716	220,847,049

(The above columns include a few estimated figures.)

The Long Island Railroad continues to rank first among local steam lines in point of traffic handled to and from terminals, its total for the year being 60,386,-

698 passengers, of whom more than half, 32,893,995 rode in and out of the Flatbush Avenue terminal in Brooklyn. The remainder were carried to and from the Long Island terminals in Long Island City and Pennsylvania Station. In addition to the heavy traffic to and from its leading terminals, the Long Island picks up and delivers nearly 10,000,000 passengers at four other principal distributing points in New York, namely, Woodside and Hunters Point Avenue, adjacent to stations of the Interborough Rapid Transit Company, where about 4,000,000 and 1,000,000 passengers, respectively boarded and left trains in 1921, and at Jamaica and East New York, where, at each, more than 2,000,000 passengers were transferred to and from rapid transit lines of the B. R. T. system. As these figures are not included in the 60,386,698 total of terminal traffic, the passenger travel of the Long Island within New York City may roughly be estimated at 70,000,000.

The traffic into and from Flatbush Avenue is larger than that of any other single railroad into any other terminal in New York. This again excepts the Hudson Terminal, which is a station upon a rapid transit line. Thus, while it has a materially greater traffic than that shown by the Flatbush Avenue count, the net results are not comparable. So far as is known, the traffic figure at Flatbush Avenue marks it as the greatest trunk railroad terminal served by a single road in the United States, if not in all the world. All the terminal traffic is handled upon one incoming and one outgoing track, and as much of the loading occurs at the peak hours only, the feat of moving the trains according to schedule is described by railroad men as remarkable.

The Flatbush Avenue station is, however, exceeded in its passenger traffic by the Pennslyvania Station and the Grand Central Terminal, which last year had a traffic, respectively, of 36,866,815 and 36,157,012. The Grand Central Station is served by two divisions of the New York Central and the New Haven, while the Pennsylvania Station is served by four railroads, the Pennsylvania, the Long Island, the Baltimore & Ohio and the Lehigh Valley. All of these terminals of course are operated by electricity exclusively.

Publicity and Public Utility Credit*

By John B. Prescott
Prescott & Snider, Kansas City, and
Vice-President, Investment Bankers Association of America

UNTIL very recent years, the approved corporate policy was one of silence, not publicity. Public utility companies were no exception. The value of good salesmanship on the part of the managements of the public utilities and of the good will of the public served was not sufficiently emphasized as an essential element of success in the business. Demonstrations of public interest were not always welcomed. The value of a monopoly for a long term of years was frequently overestimated. The public, on the other hand, utterly uninformed, believing such monopolies immensely profitable, often irritated by inefficient and insufficient service, was naturally resentful.

Such a state of affairs, though perhaps perfectly natural to the experimental stages of a new and rapidly developing industry, furnished a fertile soil for the seeds of suspicion, so cheerfully and successfully sown by the demagogue; and, it yielded an abundant crop of popular distrust, hostile legislation and, for a time, unintelligent regulation. It is easy to understand how difficult it was at first for even an able, intelligent and conscientious regulatory body, as most of them undoubtedly were, to do justice to the utility companies in face of so much adverse public sentiment. Fortunately, the utility companies, the public and the regulatory bodies have been learning in the school of bitter experience and they now seem to have entered an era of clearer perceptions and better mutual understanding and appreciation. That this better mutual understanding is contributing to the removal of many troublesome obstacles is indicated by the following, among many, incidents which have been reported:

After experience with jitney service, Battle Creek and Muskegon, Mich., voted overwhelmingly (it is reported four to one) for street car service.

Kansas City, Mo., has enacted ordinances forbidding jitneys on all streets on which street cars operate and the ordinances have been sustained by the courts.

The officials of the city of Okemah, Okla., had prepared to issue $90,000 bonds to build a municipal gas plant but the citizens, by a vote of 577 to 3, voted a franchise to a private company. A few hours later, the mayor and the citizens built a "bonfire" with the $90,000 of bonds in front of the City Hall.

The city officers of Sault Ste. Marie insisted that the street car company pay for certain paving between its tracks which the company claimed it was unable to pay. The question was referred to the Public Utilities Commission of the State of Michigan, which held that the company might suspend operation July 15, if the city insisted on the company paying for the pavement.

Constructive Educational Work Desirable

Furthermore, there seems to be a better appreciation of the value and necessity of public utility service and a growing desire on the part of the people and of public officials for reliable and complete information in regard to the public utility business. Your committee is informed that the University of Detroit will establish, beginning the next academic year, a comprehensive course in public utilities, including the principles of regulation, finance, public relations and other fundamentals; and, that Massachusetts Institute of Technology, Princeton, Ohio State University and other leading schools have established similar courses within the last few years. This public desire should be promptly met and cheerfully gratified.

In the last report of your committee[1] a brief account was given of the condition of the public utility industry from an investment banking standpoint, the need of fresh capital for development and expansion to maintain good service and keep pace with public demand, and of the conditions requisite to the ready inflow of such new capital. Your committee has been somewhat surprised in view of the rather limited publicity given the report, at the expressions of interest elicited in the financial features of the utility business.

As an illustration, the presiding officer of one of the most widely known state regulatory bodies writes as follows:

> I wish that members of legislatures could have access to this report and other data of a similar nature. The ignorance of our legislature upon such matters as this is astounding. If the I.B.A. of A. could get reliable information upon such subjects to the members-elect before the Legislature meets, they would be much more effective than anything that might be presented in committee or otherwise while the legislature is in session.

The requests for copies of this report, for purposes of distribution, are such that a reprint will be necessary. A more or less widespread public recognition of the primary necessity of the free flow of capital into the public utility business seems to be developing as well as deepening interest in the methods, conditions and cost of obtaining it. This is evident, not only from the dicta of regulatory commissions and courts, but also from articles and editorials appearing lately in leading magazines and newspapers. It appears to this committee that this public demand for information concerning the financial problems of the public utilities should be met by this association, and that it presents an invitation to do

*Abstract of interim report of the committee on public service securities of the Investment Bankers' Association of America, adopted by the Board of Governors July 22, 1922.

[1]See *Electric Railway Journal*, June 10, 1922, page 941.

constructive educational work concerning sound financial principles and practices, which should not be overlooked or neglected.

Prior to the organization of this association the investment banker was himself reserved and silent. As with the public utility operator it was his conventional policy. Times have changed and we must keep pace with them. Public confidence is no longer blind but is demanding definite knowledge as a basis. The work of this association has already accomplished much, but it should be carried forward consistently. More intimate contacts should be established and maintained with regulatory and legislative authorities, and we should do our part in developing an intelligent public opinion upon public utility matters and a more general understanding of the character, quality and value of the services rendered by investment bankers.

State of Public Utility Credit

Since the last report of this committee the decline in interest rates has induced or permitted a considerable increase in the volume of refinancing of maturing senior securities of light and power companies, and there has been a noticeable increase of junior financing. Such financing, however, has been expensive and chiefly confined to the larger companies and those of the highest established credit. The average smaller company has not as yet been greatly benefited. While there has been some refinancing of maturing senior obligations of electric railways at high rates, there has been almost a total absence of junior financing. No new projects have been developed and practically no extensions of existing lines are being built.

The greatest single present problem of the electric railways is how to obtain new money particularly through junior securities for the extensions and betterments necessary to maintain satisfactory public service.

It is of course obvious to the investment banker and is becoming more apparent to the public served and to public officials that at least two fundamental conditions must be met before new money will flow freely into junior securities.

1. There must be a sufficient assurance of the safety of principal; and

2. There must be reasonable assurance of a regular and uninterrupted return on sound investment value in the business, and this promised return must be not only "fair" but adequate and attractive.

As has been previously stated, this committee has faith in the fundamental soundness of the electric railway business but the investing public evidently has not forgotten the threats of loss due to restrictive legislation, unfair competition, popular misunderstanding and other causes. However, increasing earnings, saner regulation and a more intelligent popular appreciation of the indispensable necessity and value of electric railway service are reassuring influences which appear to be working towards a restoration of the investor's confidence in electric railway securities.

That the necessity of not only a "fair" but also an adequate return is gaining in public recognition is apparent from recent articles and editorials in leading magazines and newspapers. As samples, we quote the following from an article in a leading magazine of national circulation:

> Practically everyone who has money strives to invest it where it will bring the largest return with the greatest degree of safety. If anyone is offered an investment in a public utility that pays 5 per cent and just as good an investment in something else that pays 8 or 10 per cent, it is an absolute certainty that the investment netting the largest return will get the money. Let no one overlook the truth that money is a commodity which we buy and sell just as we buy and sell clothes and lumber. A public utility or a municipality cannot buy money for less than other people pay for it any more than this same utility or municipality can buy coal or labor for less than it is worth in the market.

And the following from an Illinois editor in whose town the street car company was seeking a new franchise:

> The prosperity of this country has come because it has been possible to make money in this country and to keep a fair share of what was made. Prosperity comes to an end when profits are taken away as fast as, or faster than, they are acquired. . . . The tendency of the last quarter of a century has been to make organization unprofitable; to put a damper on incentive and to take away any profits faster than they were earned.
>
> Remember this: Destroy the money-making possibilities of any enterprise and you wipe out entirely the possibility of the service it can and should render.

All of which is doubly applicable to the flow of money into junior securities where it is now most needed, and indicates a healthy and hopeful change in public sentiment.

National Safety Council

ARTHUR W. BRADY, president Indiana Union Traction Company, Anderson, Ind., will speak at the joint luncheon of public utilities and electric railway sections of the National Safety Council at the Detroit Athletic Club on Wednesday, Aug. 30, the third day of the Eleventh Annual Safety Congress at Detroit, Mich., Aug. 28 to Sept. 1. Alexander Dow, president Detroit (Mich.) Edison Company, will be the other speaker at this luncheon. The chairman of the joint luncheon meeting will be Homer E. Niesz, manager industrial relations department, Commonwealth Edison Company, Chicago.

C. B. Hardin, general claim agent United Railways of St. Louis, C. E. Morrison, vice-president and general manager, Utilities Mutual Insurance Company, New York, and Harry J. Bell, secretary Chicago Safety Council, will discuss the subject of "Progress in Accident Prevention in Public Utilities," on Tuesday morning. "The Financial Side of Accident Prevention" will be considered in a paper by Garrett T. Seely, vice-president and general manager Pennsylvania-Ohio Electric Company, Youngstown, Ohio. The discussion will be led by Harry B. Lucas, treasurer Philadelphia (Pa.) Electric Company, and G. T. Hellmuth, general claim agent Chicago, North Shore & Milwaukee Railroad will follow.

On Thursday morning, President Britton I. Budd, president Chicago Elevated Railways, will address the safety men on "The Human Side of Our Business." W. H. Boyce, general manager Beaver Valley Traction Company, New Brighton, Pa., and S. H. Reid, Bureau of Safety, Chicago, will lead the discussion on this subject.

Co-ordination between engineering and operating ends of the business from the standpoint of safety will be the subject of a talk by H. J. Warnick, engineer, Northern Indiana Gas & Electric Company, Fort Wayne, Ind. Discussion will follow led by F. W. Fisher, safety and employment manager, Rochester Gas & Electric Corporation, Rochester, N. Y., and Wills Maclachlan, electrical engineer, Canada.

J. F. Naylon, division equipment superintendent of the New York Telephone Company, will be the chairman of the Tuesday morning session. B. D. Haskins, Chattanooga Street Railway, will preside at the Thursday morning session.

Program of Wisconsin Meeting

THE complete program for the summer meeting of the railway division of the Wisconsin Utilities Association, to be held in Green Bay on Aug. 17 and 18, is as follows:

Morning Session, Thursday

Address of welcome by Mayor Weisner, Green Bay, and response by President J. P. Pulliam, Wisconsin Public Service Company, followed by opening address by Chairman B. W. Arnold, Eastern Wisconsin Electric Company.

Paper on "Proper Maintenance and Lubrication of Railway Bearings," by H. Cordell, Chicago, North Shore & Milwaukee Railroad.

Paper on "Proper Maintenance of Brakes and Brake Rigging," by O. R. Hill, Rockford & Interurban Railway.

Afternoon Session, Thursday

Inspection Trip—Wisconsin Public Service Company, lines and shops. Demonstration of steel ties, track construction, welding, etc. Baseball and field events at Bay View Beach Park. Swimming and water sports.

Banquet, Bay View Beach Tea Room. Address on "The Electric Railway Industry in 1922," by Labert St. Clair, director advertising section American Electric Railway Association.

Morning Session, Friday

Paper on "Regulation of Service Schedules to Suit Traffic," by Nels Rasmussen, Wisconsin Valley Electric Company.

Paper on "Safety First Practice," by C. E. Warwick, Wisconsin Public Service Company.

Round Table discussions on methods of developing traffic, collection of fares on one-man city and suburban cars, and steel ties against wood ties.

The headquarters will be at the Beaumont Hotel, Green Bay.

F. A. E. S. to Discuss Length of Working Day

AT A MEETING of the executive board of the American Engineering Council, Federated American Engineering Societies, to be held at Boston Sept. 8 and 9, two reports dealing with exhaustive investigations of the two-shift and the three-shift-day problems in numerous industries will be presented. The reports will cover transportation and other utilities, as well as manufacturing industries of the continuous type.

Dean M. E. Cooley, University of Michigan, successor to Herbert Hoover as president of the federation, will preside at the Boston meeting.

Industrial Engineers to Meet

THE Society of Industrial Engineers will hold a three-day national convention at the Hotel McAlpin in New York City beginning Oct. 18. "Economics of Industry" will be the general topic of the convention. On the evening before the convention, there will be a joint meeting of this society with the Taylor Society and the American Society of Mechanical Engineers.

American Association News

Washington Coal Representative Appointed

COL. JOHN PRICE JACKSON has been appointed executive representative for the American Electric Railway Association, National Electric Light Association and American Gas Association with offices at 949 Munsey Building, Washington, D. C., to handle coal matters for these three utilities associations. This important step has been taken to protect the vital interests of the utilities in view of the emergency created by the present strike of coal miners and railroad employees. Mr. Jackson was engaged by the Joint Fuel Committee of the three associations, of which John W. Lieb of New York City is chairman. Member companies of the associations are requested to communicate directly with Colonel Jackson on all matters with respect to the coal situation.

Colonel Jackson was formerly dean of engineering and professor of electrical engineering at Pennsylvania State College. He has served as commissioner in charge of the Pennsylvania Department of Labor and Industry, chairman of the Pennsylvania Industrial Board, and during the war was chief of the Labor Bureau and deputy director of the Army Service Corps. More recently he was manager of the industrial relations committee of the Philadelphia Chamber of Commerce.

The association is again sending out a questionnaire at the request of the national government to secure immediate information on stocks of coal and fuel requirements. The railway association urges complete co-operation in compiling these data in order that the joint fuel committee and the Washington representative may have the essential facts for use in working with the federal officials.

Safety at the Convention

THE safety committee has sent a letter to the manufacturer member companies of the association asking them to "play up" safety as a selling point in their advertising and in their exhibits at the Chicago convention. Attention is called to recently published material on the subject of safety, including the July 22 issue of the *Electric Railway Journal*, and to the fact that the safety committee will have a large display of safety advertising material itself at the convention. Manufacturers are asked to send the chairman of the committee copies of safety literature which they may have gotten out to be included in this display.

Convention Entertainment Features Being Arranged

THE convention committee on entertainments met on Aug. 2 in the office of J. V. Sullivan, chairman. The progress reports brought in by various sub-committees showed that the entertainment features at this year's convention promise to be most attractive.

Arrangements are being made by N. G. Symonds with about fifteen golf clubs around Chicago to allow those attending the convention to play, though no tournament will be arranged. It was tentatively planned to have a special card printed with the A.E.R.A. seal on it, and to purchase souvenir pencils for distribution to the players.

On the basis of information brought in by E. E. Kretschmer, there will be an orchestra of eight men at the reception space on the Pier for four afternoons. He was authorized also to engage an orchestra for the evening of the formal ball at the Drake Hotel. On the recommendation of W. H. Beattys, Jr., tea service for four hundred people will be provided in the reception room for the same four afternoons. An auto trip around the park system and to other places of interest in Chicago has been planned for the entertainment of the ladies on Tuesday.

All the committee was in favor of the program for the feature night on Wednesday at the Marigold Gardens, as proposed by the sub-committee of which Frank Johnson is chairman. Secretary Welsh suggested the tickets for the feature night be assigned according to priority of applications up to some deadline that will be set, after which tickets will be sold without regard to location. In this way it was thought that much of the confusion could be avoided in making last-minute assignments of tables.

Those present were J. V. Sullivan, chairman; N. G. Symonds, H. J. Kenfield, E. E. Kretschmer, W. H. Beattys, A. P. Jenks, Frank Johnson, Mr. Wright, Labert St. Clair, Secretary Welsh, and D. F. Hine representing H. L. Brown.

Engineering Executive Committee

A MEETING of the executive committee of the American Electric Railway Engineering Association was held in the New York office on Aug. 9 to go over the reports of the papers to be presented at the Chicago convention and the transaction of other business. There was a good attendance, those present being C. W. Kimball, Washington, D. C., president; L. C. Datz, Birmingham, Ala., vice-president; and R. C. Cram, Brooklyn, N. Y.; Charles R. Harte, New Haven, Conn., and Daniel Durie, Connellsville, Pa., members of the executive committee. Working in connection with Mr. Hecker, the association engineer and Secretary Welsh, many topics were considered and rapid progress was made.

Helpful Reports Issued

THE following special reports and compilations prepared by the bureau of information and service of the American Association are now available to member companies in good standing upon request:

Public Utility Laws: A summary of the laws creating the state public utilities commissions, giving an analytical digest of the main provisions covering their jurisdiction and powers over transportation companies. The third installment of the compilation began in June.

Securities Issued by Public Utilities in 1922: A list of new public utilities securities, divided between electric railways and other utilities and showing the name of the issuing company, the amount of the issue, the rate of interest and the offering price.

Practical Experience with Welfare Work: A collection of statements of industrial companies gathered by the National Industrial Conference Board, giving a brief outline of experiments with welfare plans, the results obtained and expressions of opinion as to their value.

List of Cities in Which Safety Cars Are Operated: Showing number of safety cars operated in each city based on data furnished by manufacturers.

Use of Transfers and Reduced Rate Tickets: Shows for a number of companies the cash fare and ticket rate in 1921 and 1920 and the percentage of revenue passengers using tickets and using transfers in both years.

In addition to the above supplements to the fare bulletin, the wage bulletin and the cost of living studies have been prepared bringing them down to date.

News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

San Diego Franchise Refused

Company Will Carry the Franchise and Paving Questions Direct to the Public

Following refusal of the Common Council of San Diego, Cal., to grant to the San Diego Electric Railway a franchise to lay tracks on Sixteenth Street, the company has decided to carry the issue direct to the people. It is causing initiative petitions to be circulated, asking the Council to submit the question to the electors at a special election to be called for that purpose. At the same time petitions are being circulated by the company initiating an amendment to the city charter to eliminate the present charter requirements imposing a 2 per cent franchise tax and requiring the company to maintain the pavement between the car tracks and for 2 ft. on each side of the tracks.

Petitions Signed Liberally

Both petitions are being liberally signed. It is expected to submit them to the Council within the next few days, when it is believed, at least 8,000 signatures will have been attached to each petition.

The proposed Sixteenth Street franchise follows present charter provisions and prescribes in general the same terms and conditions as the general franchise held by the company. It is drawn to expire on Sept. 1, 1952. The application is for four blocks of double track, from Market to Broadway on Sixteenth Street, equivalent to nearly one-half mile of single track.

In a newspaper publicity campaign following its original application for the franchise, the company stated the franchise was desired for two reasons:

Reasons Franchise Is Desired

1. To give better service to workmen and navy men employed at the new naval repair base at the foot of Thirty-second Street, by providing a cross-town cut-off and eliminating the longer ride to the Fifth and Broadway transfer point.

2. To save money in getting cars to and from the carhouses.

Claus Spreckels, general manager, asserted that the saving in wear and tear on equipment and in time because of the shorter haul would be at least $10,000 a year. The company proposed, if the franchise were granted, to route National City and Logan Avenue cars to the downtown section by way of Sixteenth Street and Broadway instead of the present route of Market Street and Fifth Street.

This proposal resulted in arousing violent opposition on the part of merchants and property owners on lower Fifth Street, who contended that lessened car service on Fifth Street and Market Street would result in a loss of a great amount of business to them. The railway management claimed that car service would still be ample, as the Imperial Avenue, Market Street and Woolman Avenue routes would continue to serve that district.

The political power of the merchants prevailed, however, and the company's franchise application was rejected, with the result that the company has invoked the initiative to gain its ends. Business men of upper Fifth Street and Broadway, the heads of the school system, the naval commanders and many other prominent citizens have expressed themselves in newspaper interviews as in favor of the new routings proposed by the company.

The proposed charter amendment initiated is along the lines recommended by the State Railroad Commission and follows an act of the last Legislature, designed to relieve electric railways of paving burdens and the 2 per cent franchise tax, and to give power to the Common Council to grant indeterminate term franchises hereafter, and to make resettlement of present existing franchises to conform to the new amendment.

Text of Amended Section

The text of the proposed amended charter section is as follows:

Sec. 9. Every franchise or privilege to construct or operate street, suburban or interurban railroads upon any public street, highway or public property in the city of San Diego hereafter proposed to be granted by said Common Council shall be granted for such period of years and upon such terms and conditions and in such manner as the general laws of the State of California in effect at the date of application for such franchise or permit provide, and upon such terms and conditions as are not in conflict with general law which said Common Council may in the ordinance granting such franchise prescribe.

The Common Council shall have power and is authorized to provide for a general resettlement of the franchise rights of and to grant a resettlement franchise for an indeterminate period to any person, firm or corporation actually engaged in operating a street, suburban or interurban railroad in the city of San Diego upon written application therefor, upon such terms and conditions and in such manner as the general laws of the State of California in effect at the date of application for such franchise provide. And said Common Council in such resettlement of any such franchise may impose such other and additional terms and conditions as are not in conflict with the general law and which said Common Council may in the ordinance granting such indeterminate franchise prescribe.

The company has also applied to the Common Council for franchises on Twenty-fifth Street and Market Street as follows: On Twenty-fifth Street from Broadway to K Street, standard double-track line, equivalent to a mile of single track; on Market Street from Twenty-fifth to Thirty-second Street, single-track line of light construction, approximately 1 mile long, the company to be relieved of filling in requirements for five years. These franchises have been recommended for passage, but have not been finally acted upon.

No Surface Car Service Order

The New York Transit Commission has announced that no specific general orders will be issued regarding improvement of service on the surface lines, as had been done in connection with the rapid-transit companies. General Lincoln C. Andrews, chief executive officer of the commission, is to have complete charge of matters pertaining to surface transportation, subject to appeal by the companies to the commission. Representatives of sixteen surface lines and systems who were present at a conference before the commission on Aug. 3 agreed to the proposal.

General Andrews was asked by Chairman McAneny to give his conclusions based upon the investigation of the commission into service on the surface lines. He said:

> The appearance of the cars, their cleanliness and suitability for service, the courtesy of the employees, the safety and efficiency of operation—in fact, everything that goes to make operating service attractive and tends to sell it to the public, are matters of pride as well as of personal responsibility to the operator.
>
> I believe that the commission can secure far better service for the public from the surface companies by leaving this responsibility in the first instance upon the operator and holding him to it, and by setting up proper standards of service to be met by progressive steps as rapidly as the condition of each company permits. With the conclusion of the intensive work done in connection with the valuation department, I shall be able to start a reorganization of the work of the Transit Bureau which will enable us to keep in closer touch with the daily work of the operating companies. We should thus be able, through the co-operation of the companies, to improve the details of operation until ultimately New York may be given a street car service of the sort it is entitled to have—the best in the country.

Experts from Other Cities Will Assist in Investigation

Traction experts and city officials from other cities will be asked to appear before Mayor George P. Carrel's street railway committee to assist that committee in its investigation and consideration of the railway problem in Cincinnati, Ohio.

The resolution provides for the appointment of a sub-committee of five to function during a six-weeks' vacation period which the committee will take this month and part of next month. The committee will make its report at the next meeting of the general committee, Sept. 11.

Under the resolution the sub-committee will have authority to investigate and report on the expense of employing expert accountants and traction experts and the character of the reports that are to be obtained. The committee also will be authorized to receive from the Cincinnati Traction Company and the Cincinnati Street Railway any proposition of adjustment which the companies may desire to offer.

CONFUSION IN HANDLING TRAFFIC AND COMMUTERS AT THE CHICAGO & NORTHWESTERN RAILROAD STATION

Chicago Rides Again

Surface and Elevated Transportation Resumed on Aug. 7 After Six-Day Tie-Up—Men Accept 12½ per Cent Wage Reduction—Company Yields Every Point on Working Conditions—"L" May Ask for Fare Cut

CHICAGO returned to transportation normalcy on Sunday night, Aug. 6, after a six-day tie-up of both elevated and surface traction systems. The resumption of both elevated and surface transportation came after the men had ratified by a two to one vote the agreement reached on Aug. 5 by their leaders to accept 70 cents an hour, a 12½ per cent wage reduction. The company yielded every point on working conditions, including continuance of the eight-hour day and all existing rules covering pay for fall-back, layover time, meal time and reporting time.

The new scale on the elevated will be 72 cents per hour, or 2 cents higher. It was announced by Britton I. Budd, president of the elevated lines, that Gilbert E. Porter, chief counsel for the company, will go before the Illinois Commerce Commission in the near future and ask for a revision downward of the fare rates.

The old "L" wage scale of 82 cents an hour will remain in force until the fare is lowered by order of the commission. This order is expected about Sept. 1. At that time it is believed the cash fare will be reduced from 10 to 9 cents. This penny reduction, the company estimates, will mean an annual loss in revenue of $1,800,000, while the 10-cent wage reduction will amount to an annual saving of only $1,100,000.

The complete new scale for the elevated trainmen is as follows:

	First Three Months	Next Nine Months	After One Year
Motormen	66	67	72
Conductors	65	65	66
Extra Guard	62	63	64

Regular guards will receive 65 cents an hour after one year of service and the pay for towermen will range from 75 to 79 cents an hour. All these figures carry a flat 10-cent reduction. All other classes of elevated employees will receive wage reductions in the same ratio of approximately 12.2 per cent.

The Surface Lines is still nogotiating with the eight remaining unions to bring about an equal downward revision of their wages. These unions include the track men, substation operators, certain shop men, line men, etc. Some of the shopmen are included in the agreement with the trainmen. Besides these reductions in wages the company will have to reduce its expenses for maintenance, materials and damages, and effect other economies to make a living rate of return.

The settlement of the strike was reached after Henry A. Blair, president Chicago Surface Lines, and the

STATE STREET LOOKING NORTH FROM MADISON, SHOWING THE VOLUME OF TRAFFIC WHICH HAD TO BE HANDLED WITH ONE-WAY RULES IN THE STRIKE

VEHICULAR CONGESTION AT STATE AND MADISON STREETS, MADISON BEING THE POINT AT WHICH THE DIRECTION OF ONE-WAY TRAFFIC ON STATE REVERSED

union committee had whittled their differences until they were only 4 cents apart on their figures, the union holding out for 72 cents and the company bettering its former compromise offer of 65 cents by 3 cents. The whirlwind finish of a situation which had caused carless streets for an extended period and which was leading toward a probable attempt to operate the cars with strikebreakers, came after Mr. Blair summoned the aldermanic-citizens committee and the president of the Chicago Association of Commerce to participate in the conferences. Four hours of continual pounding away and exhorting by these committees finally brought the contending parties together, the company's board of control agreeing to what it says will practically wipe out its profits in making the concession.

The wage controversy of the Surface Lines in short was as follows:

	First Three Months	Next Nine Months	After One Year	Night Runs
Old wage	75	78	80	82
Company's offer	55	58	60	62
Company's first compromise	60	63	65	67
Union's first compromise	67	70	72	74
Final settlement	65	68	70	72

The Surface Lines employees, it is understood, will agree to a clause in the contract with the company by which wages may be changed after thirty days' notice in case a further adjustment in fares is ordered by the Illinois Commerce Commission. The union men accepted the thirty-day clause after the company had withdrawn its opposition to the eight-hour day.

The acceptance of the 70-cent scale by the company, which is 5 cents higher than wages paid to any other street railway men in the country, will mean a reduction in operating wages of approximately $4,000,000 a year to the company. The revenue figures from June 15, 1922, when the 7-cent fare was put into effect, until July 31, show a decrease in revenue of $813,000 compared with the same period last year. Thus it would seem that the average decrease in daily revenue for the forty-seven days that the lower fare has been in effect is $17,300 while the reduction in wages takes up approximately $11,000 of this amount. The actual decrease in revenue from the beginning of the fiscal year, Feb. 1, until July 31, is $595,000. For the first four and one-half months of the fiscal year under the 8-cent fare there was an increase of about $218,000 in revenue or about 1 per cent. The fare reduction of 1 cent has more than wiped out this increase and leaves the cumulative earnings up to July 31 $595,000, or 2 per cent, behind last year's figures.

Perhaps one of the most amazing circumstances of the strike was how the people adapted themselves to a carless life. It was the spectacle of the second largest city in the United States showing the world for the third time in as many years that even a tie-up of its habitual transportation could not completely throttle its industry. No one seemed to be depressed on the first day of the strike, which had the appearance of an annual holiday until it began to rain, and then enthusiasm was somewhat dampened.

The way in which the suburban steam roads came to the rescue aided materially in lessening the traffic tangle. During the strike, the Illinois Central Railroad abandoned all schedules during rush hours and operated trains at one and one-half minute intervals. This road handled an average of 150,000 passengers daily for the five week days of the strike and about 63,000 on Sunday. The normal week-day traffic on the Illinois Central is 73,500 passengers and on Sundays 25,725. A statement published by the Chicago & Northwestern Railway shows that on the first day of the strike, that road carried 110,000 suburban passengers, business which required 225 trains. On the next three days of the strike approximately 135,000 passengers were carried daily and 243 trains were operated per day. On a normal business day the average number of passengers carried in and out of Chicago by the suburban trains on the Chicago & Northwestern is approximately 60,000 and the number of trains necessary to handle this business is 166. No definite figures are available for the other steam roads giving suburban service, but it is estimated that the Chicago, Burlington & Quincy Railroad carried about 40,000 passengers daily while the Rock Island, the Pennsylvania, and the Chicago, Milwaukee & St. Paul roads handled almost 100,000 passengers daily on suburban runs.

ONE OF THE MAYOR'S BORROWED BUSES

The Chicago Motor Bus Company also did its utmost to cope with the situation, and on it fell the task of transporting the north shore passengers, who had no suburban steam road to fall back upon as did those living on the south shore. These buses coming only to Randolph Street instead of into the loop and running from 5 o'clock in the morning until 1 o'clock at night, carried 40 per cent more passengers than normally. Of the seventy-five buses, practically all were in service continuously and the completion of five new buses recently was a welcome addition to the fleet. Although generous invitations were extended by the city administration to outlying bus companies to bring their vehicles into Chicago, few responded and it is doubtful whether the total exceeded fifty.

Most of the jitneys were resurrected for the occasion and many trucks were equipped with improvised seats. The market for stepladders was reported to be very active during the strike. Prevailing fares were 25 cents, but as competition increased, some reduced the cost of the ride to 15 cents. Even cheaper rides than this were furnished by a few buses which were borrowed by Mayor Thompson. This was about the only help that he gave during the strike and he is reported to feel satisfied that he has kept his 5-cent fare pledge. Many large concerns ran special fleets of trucks for their employees.

Privately-owned automobiles on all routes of traffic filled the large gap between these means of emergency transportation and the 2,500,000 daily rides that are usually furnished by the surface and elevated lines. It was estimated that one-quarter of the automobiles in Illinois, or about 200,000, were in operation in Chicago during the strike and each operator did his bit by keeping all the seats filled.

Fortunately, the duration of the pre-strike negotiations gave time for the city officials to formulate some traffic scheme that could be put into effect immediately with the cessation of car service. The streets in the downtwon loop were put on a one-way basis and the manner in which this traffic regulation worked out has led some to believe that one-way streets must become permanent. Major R. F. Kelker, city traffic expert, declared that the strike proved that one-way streets are a decided asset in Chicago and he has already been requested to draft a new plan for routing surface cars whereby the one-way streets can be retained. He realizes though that such a rule would require the conversion of rolling stock for entrances on both sides and that nearly all special track work would have to be reconstructed.

Business in the shopping district downtown and outside, it was estimated, suffered losses of about $1,000,000 per day. This was in retail sales, which, since the strike started, appeared to fall off about one-third in volume. It was estimated that an average of 300,000 persons kept out of the loop district each day who otherwise would have come downtown.

For the Commonwealth Edison Company, which furnishes all the power used by both the Elevated and the Surface Lines, the strike came at a most opportune time. It resulted in a saving of 1,900 tons of coal daily or a total of about 11,400 tons. The railway load in Chicago is about one-third the total carried by the Commonwealth Edison Company. With coal prices nearly doubled and reserves for about thirty-six days only, and a ten days' supply en route, this saving eased the tension in this direction slightly.

The illustrations which accompany this account of the strike are reproduced by courtesy of the Chicago *Evening American.*

Court Ousts Jitneys

Transportation Emergency Does Not Exist Where Lawless Element Intimidates Passengers

Justice Charles A. Pooley in Supreme Court in Buffalo has handed down a decision directing Mayor Frank X. Schwab to enforce the state law and prohibit the operation of jitney and bus lines within the city of Buffalo. The decision follows the mandamus action brought by the International Railway because of the Mayor's refusal to stop the operating of jitneys although normal service is being maintained on all local and interurban lines which are operated by the International under Mitten Management.

Immediately following the handing down of the decision Mayor Schwab issued an order cancelling temporary jitney permits he had issued at the outbreak of the strike on July 1. Police were ordered to arrest jitney drivers who solicited passengers or charged a fare. Members of the Buffalo Jitney Owners' Association, however, are operating automobiles, depending upon passengers to make a donation. An effort was to have been made late in the week to break up this practice.

In his decision ordering Mayor Schwab to enforce the law regulating jitney and bus lines, Justice Pooley says that, "aside from any question involved in the origin and progress of the street car situation, the law is plain and no argument is attempted to refute it." The Weatherwax vs. Watt case Albany 118 N. Y. Supp., 559 is cited by Justice Pooley. This decision was upheld by the appellate division. In his decision, Judge Pooley said that a small fraction of the population seeks to defy the law by wrecking the cars and assaulting men who attempt to operate them, as well as the men and women who attempt to ride in them. As a result a complete railway is practically at a standstill so far as its use by the public is concerned, and the substitute offered is an illegal attempt to perform the service. "This plain defiance of the law," says the court, "is presented as a basis for requesting the declaration that public convenience and necessity require the substitute service. The writ of mandamus may issue."

The Public Service Commission has notified the municipal authorities that it cannot grant the city's application for a certificate of public convenience and necessity to operate motor buses in the city streets and for permission to issue permits for operating buses to jitney drivers. In denying the city's application, the commission says it finds that the city has not the power either under its charter or any other special or general law to operate jitneys or bus lines.

In his arguments before Justice Pooley, Henry W. Killeen, counsel for the International Railway, blamed the Mayor for the Buffalo strike. He charged that the strike is being run from the Mayor's office and that the business agent for the union collaborates with the Mayor in issuing all statements regarding the strike.

Justice Pooley interrupted the arguments to explain his views on the situation. He denounced strikers and their sympathizers who are intimidating passengers, stoning cars and hurling acid at loyal employes. He said, however, that the only question before the court was whether jitneys were being operated in the city in violation of law.

Mr. Killeen argued that it is the duty of the Mayor as commissioner of public safety and head of the police department to order the chief of police to direct the arrest of all jitney drivers. He argued that as long as the Mayor is in sympathy with the striking carmen and refuses to enforce the law, it is the duty of the court to mandamus him to enforce the law and he cited the Albany case where the court ordered the commissioner of public safety to drive the jitney lines off the streets. This court was upheld by the appellate division of the Supreme Court. Judge Pooley indicated that he would follow the decision in the Albany case.

President Tulley of the International in a statement addressed to the strikers says:

> Czarlike domination by the union exists, under which men who have been a lifetime in the company's service, and who are unfitted for other work, are required to report daily to the union, under threat of bodily harm, insult to wife and abuse of children, being thus forced to remain out of work while the opportunity to get their old jobs back is rapidly slipping away.

To the owners of the stock of the International, Mr. Tulley makes this public statement:

> International Traction stock, par value of $15,000,000, was entirely wiped out by the losses of the 1918 strike and inefficient operation, due to union domination of both men and management.
>
> International Railway stockholders in 1921 were forced to contribute more than $2,000,000 by cash assessment before Mitten Management could undertake to reorganize the property so as to insure uninterrupted service to the public, continued employment to the men and an assured return to the owners.

Then in a statement to the public, Mr. Tulley explains in detail the results accomplished under the Mitten co-operative plan at Philadelphia.

Mr. Tulley made this statement on the situation to the *Electric Railway Journal.*

> Buffalo in 1901 was saved from a threatened strike during Pan-American year, by Mitten policy, and for more than ten years peace prevailed thereunder. After 1913 union control became increasingly dominant under the then management's policy of favoring the union in hope of securing industrial peace.
>
> Discipline suffered, accidents increased and, although a signed agreement between the union and company had no closed shop provision, employees were nevertheless forced to join the union.
>
> This union to extort a higher wage, which the company was temporarily unable to pay, in 1918 subjected Buffalo to the humiliation of a long drawn out strike during the war-time period when everyone worth while was forgetting self and working to help win the war.
>
> Buffalo is suffering great loss and inconvenience from the present strike, which makes it imperative that Mitten Management now plan to remove the possibility of future strikes.
>
> Mitten Management is neither for nor against organized labor, but cannot have further dealings with a union which neither recognizes the need of good railroading, nor the necessity of living up to its undertakings.

Employment Service of the Four National Engineering Societies

An employment service for engineers of every variety of training and experience is conducted by the four national engineering societies of the United States. This service brings in touch with the various business men the service of 50,000 trained technical men who are members of these societies. One of the objects of it is to show to the various commercial houses the aid which engineers are rendering to others in the same lines and to help these firms and corporations secure similar assistance.

Men of engineering training are prominent in all branches of commercial endeavor and their creative ability is recognized as being of great help in the building up of the nation.

This service is in a position to supply civil engineers, mechanical engineers, electrical engineers, sales engineers, production managers, superintendents and other trained executives. It is under the direction of W. V. Brown. His office is in the United Engineering Building, New York City. The service is free to both employer and to employee.

Motorman "On the Job" Saves Life

A motorman in the employ of the Altoona & Logan Valley Electric Railway, Altoona, Pa., has been publicly commended by general manager Crane for saving a life while operating his car late in the night.

While he was running his car below Bellwood Motorman Housel saw an electric flash. He knew at once that sign was something unusual and so he brought his car to a quick standstill. He went out to investigate and found lying on the ground a few feet away along the track, a man. The man, in the employ of the Home Electric Light Company of Tyrone, had been sent out to repair a break in the power wire. He came into contact with the heavily-charged wire and was hurled to the road. Just that one flash which occurred when he touched the wire was seen by this wide-awake motorman. An editorial in the Altoona *Mirror* says that Motorman Housel was "On the Job."

Traffic Survey Will Be Completed by August Fifteenth

John A. Beeler announces that by Aug. 15 he hopes to complete the survey now being made by him of the properties of the New Orleans Railway & Light Company. It is estimated that 250,000 observations will be required to reach an accurate idea of the changes that may be necessary to the present system so as to give the best possible service at the minimum cost. Until the work of his engineers and technical assistants is completed, however, it will not be possible to determine what reroutings should be made nor how much additional equipment will be required.

Power Improvements Planned

The Indianapolis (Ind.) Street Railway planned to present a petition to the Public Service Commission on Aug. 12 asking for permission to carry out a large program of improvements. According to Robert I. Todd, president of the company, all the financing of the project has been completed. The entire proposition links up with the question of adequate power.

Mr. Todd said recently the West Washington Street power plant was obsolete and should have been scrapped some time ago. The future power development will be made at the West Tenth Street power station. Included in the expansion and rejuvenation of the company are first, more power; then cars, new shops, new carhouses, extensions and a general overhauling of tracks. Under the proposed plans the company will build at least six and probably eight substations in Indianapolis.

Akron Company Successful at Referendum

By a majority approximating 11,000 in the City of Akron, the Northern Ohio Traction & Light Company won its franchise fight at the polls on Aug. 8. With four precincts missing the vote Wednesday morning stood: For the ordinance, 16,273; against the ordinance, 5,473. The company carried every precinct in the city except one.

The ordinance voted upon Tuesday was passed by the Council last April and a referendum election was called. It provided for:

1. A straight 5-cent fare until Feb. 1, 1924.
2. Construction of a new line across the new $2,000,000 viaduct, linking that section known as North Hill with the downtown section.
3. Establishment of eight new bus lines.
4. Rebuilding West Market Street line.

Announcing that it had faith in the voters of Akron, the company, six weeks ago, began the construction of the new line and the rebuilding of the West Market Street line. It also purchased eleven buses, which have since been delivered and put into service.

The vote Tuesday shows that the people approved the trust placed in them by the company. The Akron franchise fight began four years ago when the Morse-Witwer franchise ordinance was defeated by a vote of six to one. Since that time sentiment has materially changed and the result was the vote Tuesday.

Be a Rooter for the Railroads Not a Booster for the Bus

The set of resolutions adopted some weeks ago by the Boone, Ia., Chamber of Commerce and forwarded to Boone merchants urged the shippers of Boone to send their freight via the railroad; that the truck was only fair weather service which would stop operating in the winter. The same arguments were made with respect to the passenger buses which "daily use our public roads as right-of-way and our streets as stations." In the opinion of the board of directors of the Mercantile Board, so says the letter, there is no town in the entire State which owes more to the railroads than Boone, which has had the service of the Fort Dodge, Des Moines & Southern Electric and the Chicago & North-Western. The Chamber of Commerce tells the people to boost for the railroads—"they are your best friends." The letter, signed by the secretary, was prepared after information had been received that truck lines for handling freight had been established between Des Moines and Boone and possibly to Fort Dodge and Marshalltown and Boone.

May Electrify Line

The Eagles Mere Railroad, a steam road built in 1892 and operating between Sonestown, Pa., Eagles Mere and Eagles Mere Park, a distance (one way) of 10 miles, has been purchased and is being run by the hotel interests at Eagles Mere. It is a narrow gage road, originally 8 miles in length, but extended in 1904 to the Eagles Mere Park, making an extra distance of 2 miles, total 10 miles length.

The new owners, who have incorporated the line into the Eagles Mere Railway Company, with Herman V. Yeager as general manager, are planning many extensive improvements. It is planned first to change the line from narrow gage to standard gage and also to either electrify the road or operate a gasoline car service.

Publicity Activities Extended

In order that the publicity interests of Henry L. Doherty & Company, New York, N. Y., may be adequately presented to the newspapers and magazines addition of two new members to the New York organization is announced:

Frank L. Blanchard, former managing editor of *Printer's Ink*, has been made director of the company's publications and advertising.

George B. Walker, late secretary of the public relations committee of the American Banker's Association, is news editor.

Publication of the *Doherty News* has again been started.

Accept Four Per Cent Wage Cut

Motormen, conductors and carhouse employees of the South Covington & Cincinnati Street Railway, Covington, Ky., have accepted a wage reduction of 4 per cent. The new wage scale is as follows: 48 cents an hour, for motormen and conductors in service more than one year; 45 cents an hour for employees in service over three months and 43 cents an hour for new men.

The schedules formerly were 50, 48 and 45 cents an hour. Carhouse employees' new wage scale ranges from 35 to 46½ cents an hour. Other employees including trackmen have not been reduced. The new schedules are retroactive to July 1.

Elevated and Subway Franchise Sought in Buffalo

Dr. Carl H. Guess, 1095 Tonawanda Street, and Conrad V. Brunner, 139 Highgate Avenue, Buffalo, have petitioned the City Council of Buffalo for a fifty-year franchise to build and operate an elevated and subway system through about a dozen streets in Buffalo at an estimated cost of $75,000,000. The petition filed with the municipal authorities states that a subway would be built from the Main Street wharf at the Buffalo River to the north city line, a distance of about 12 miles, with elevated lines on Niagara Street from Shelton Square to the city line and across Hertel Avenue from Tonawanda to Main also in such east side streets as Broadway, Genesee and Fillmore. The promoters promise all-day service, but no reference is made to the fare which would be charged.

News Notes

May Operate Electric Cars.—It is reported that business men living in towns along the defunct Kansas City & Northwestern Railway have called a meeting at Seneca, Kan., to consider the proposition of operating electric cars over the line.

New Franchise Being Negotiated.—The Manitowoc & Northern Traction Company, Manitowoc, Wis., is seeking a fifteen-year franchise to supplant its twenty-year privilege which soon expires. The company expects to purchase a local bus line to provide service in the south and southwestern part of the city but before closing that deal wants assurance of exclusive rights.

In Favor of Retaining Service.—If an agreement on paving can be reached operation of the Dunkirk & Point Gratiot Railway, Dunkirk, N. Y., serving visitors to the Point Gratiot Park and bathing beach will be continued. The Common Council is willing to make changes in connection with the paving of West Front Street if the abutting property owners give their consent. The company is unable financially to bear the paving expense but is willing to raise its tracks to the level of the proposed paving.

Compiling a History.—D. E. Parsons, general manager of the East St. Louis & Suburban Railway, East St. Louis, Ill., is gathering all possible data and historical facts on street and interurban railways in Belleville and connecting this city with East St. Louis and St. Louis. No comprehensive account of railway activity in this section has ever been recorded and it is with the idea of compiling such a history that Mr. Parsons has started on this work. He has announced that he would appreciate the co-operation of those well-informed on the subject.

Financial and Corporate

Expert's Attack Resented

President of Twin City Rapid Transit Retorts Tartly to Statements Made by Dr. Wilcox

Horace Lowry, president of the Twin City Rapid Transit Company, has generally refrained from making statements concerning the serial report which Delos F. Wilcox is making to the Minneapolis City Council in connection with the appraisal of the Minneapolis Street Railway preparatory to appearing before the Minnesota Railroad & Warehouse Commission in a hearing to determine a permanent fare. He has, however, made a vigorous statement in reply to the serial issue of Aug. 2, in which reflection was made upon the founders of the company and a suggestion that they had unloaded watered stock on the public.

Mr. Lowry said in part:

The railway will present all matters pertaining to the value of its properties to the warehouse commission as soon as the city of Minneapolis is ready to proceed with its side of the case. The company is loath to enter into any premature discussion with Dr. Wilcox concerning its affairs.

However, Dr. Wilcox, in his last statement, has gone out of his way to create such an erroneous impression, that the company feels it should be corrected in justice to the public and to itself.

The law provides that the company is entitled to a reasonable return on the value of its cars, tracks, shops, power houses, buildings, and all other property. Obviously, the amount of stock of the subsidiaries or the Twin City Rapid Transit Company has no relation whatever in the determination of the "fair return" on Minneapolis street railway property.

By direct inference Dr. Wilcox declares that the stock of the company was unloaded on "widows and orphans," when it is a matter of public record that the stock of the Twin City Rapid Transit Company has been listed for more than thirty years on the New York Stock Exchange, and any citizen of Minneapolis, or any other place, could and can at any time purchase it.

The directors of the company have been chosen by the stockholders on account of their belief in the director's business ability, and not because of the amount of stock owned by these directors. The officers have been elected by the directors due to their belief in the ability of these officers to operate the property efficiently. It is a well established fact that officers of large companies are rarely heavy stockholders of such companies.

The slur cast by Dr. Wilcox upon the men who built the Minneapolis Street Railway need not be answered. The records of these men speak for themselves.

In conclusion, the whole question must rest upon what the commission determines under the law to be the fair value of the property, and Dr. Wilcox's personal opinion as to the past or future action of the Minneapolis Street Railway and the Twin City Rapid Transit Company will have no bearing on the case. The company feels that it always has been fair to the public and means to continue to be so.

Mr. Wilcox said in effect that Minneapolis will never be able to get a satisfactory solution of its railway problem until it finds some way of being rid of the incubus of the over-capitalized and locally irresponsible Twin City Rapid Transit Company; that co-operation with the city in the valuation business means only that the company will accept concessions upward. As Mr. Wilcox sees it the only solution of that problem, unless it be on the company's own terms, will come from the exercise of compulsion. According to him it is evident the company had lost confidence in the State Railroad & Warehouse Commission and the State courts and would not accept the judgment of the commission on valuation unless it coincided with the company's own ideas. The impression that the Lowry and Goodrich families and their associates controlled the Twin City company through ownership of the majority of its capital stock was erroneous, as they held only a small percentage of the stock.

Taxpayers Urge Purchase Action

Owing to the actions of a special committee of city officials appointed to arrive at a valuation of the properties of the Market Street Railway, San Francisco, Cal., a resolution was introduced at a recent meeting of the Board of Supervisors asking that the matter be indefinitely postponed. It was found, however, that the unanimous opinion of the larger bodies working for the upbuilding of the city, was that the matter should not be postponed. In consequence the decision of the Taxpayers' Committee was to invite the officials of the Market Street Railway to sit down with them and go into details for the purpose of arriving at the best possible price the company would be willing to sell its properties to the city. The idea would then be to present the matter to the full Board of Supervisors with the desire that the question be placed on the ballot at one of the coming elections so that the citizens can express their opinion in reference to the advisability of the purchase of the properties. This procedure would be in accordance with the Amendment carried at the election of two years ago in favor of buying these properties and unifying the entire transportation system.

The taxpayers explain that under present conditions neither the Market Street Railway nor the Municipal Road can build extensions and that the city has been brought to a standstill in this regard. The point made in their behalf is that the people have spoken regarding this by a large majority, but that despite this the Supervisors and the Market Street Railway have so far simply interchanged letters. On this phase of the matter the committee representing the taxpayers says:

The reasonable, ordinary business-like way to arrive at a mutually agreeable price, if possible, in so large a transaction when both parties are here in this city, is by conferences. The representatives of the Market Street Company have expressed their willingness to meet with the representatives of the city. This, the representatives of the city should do for a mutual interchange of ideas as to price, terms and how the same are arrived at. Until this is done, the representatives of the city cannot feel that they have fully discharged their duties in the matter, and to end negotiations at this time would be extremely premature.

Revised Valuation Figures Presented

Revised valuations of operating properties of the electric railways in Queens Borough were submitted to the New York Transit Commission on Aug. 7 by the bureau of valuations in concluding its appraisal of all New York City tractions for purpose of effecting a consolidation of transit facilities under municipal ownership.

Appraisal of New York & Queens County Railway property, originally valued on basis of first cost at $3,957,382, is changed to $3,370,367; on basis of 1921 prices, original estimate of $9,883,660, is revised to $9,937,286. Estimate of Long Island Electric Railway property, on basis of original cost is changed from $511,678 to $300,059; revision of appraisal based on 1921 prices increases original estimate from $1,728,528 to $1,699,717.

Revised valuation recommended for acquiring New York & Long Island Traction Company property is increased $9,729 to $466,300, while revision of estimates based on 1921 prices increases valuation from $1,335,803 to $1,340,323. Original cost estimate of Ocean Electric Railway property is increased from $268,970 to $311,086, and estimate based on last year's prices is increased from $770,240 to $773,356. Valuation recommended for Manhattan & Queens Traction Corporation property is increased $5,148 to $1,130,972, while an addition of $5,627 makes value based on 1921 prices $2,164,498. Addition of $1,170 to original cost estimate of New York & North Shore Traction Company property makes revised estimate $46,370; appraisal based on 1921 prices remains unchanged by the commission at $389,082.

In all cases, recommended valuations are based on original costs less expenditures necessary to place property in first class operating condition. Valuations at 1921 prices are after depreciation.

American Water Works Assumes Control

Control of the Potomac Public Service Company, formerly the Hagerstown & Frederick Railway, Frederick, Md., has passed to the American Water Works & Electric Company of New York. The offer accepted at a meeting of the directors of the Potomac Company was $30 a share for the common stock, the proviso being that 70 per cent of the stock would be disposed of. This condition was more than met.

The American Water Works & Electric Company, will likely have representatives on the executive committee, and on the board of directors, but outside of these representatives, there will be practically no change in the management.

The company also controls the West Penn Company, which recently closed a similar deal for the purchase of control of the Monongahela Power & Railway Company, operating in territory adjacent to that served by the Potomac Public Service Company.

All War Loans to Utilities Repaid Save Two

A statement of the present status of all loans made to public utility corporations under the war finance act has been prepared by the War Finance Corporation. It is as follows:

Appalachian Power Company, New York	$1,000,000	Paid in full
Aurora, Elgin & Chicago Railroad, Aurora, Ill.	219,000	
Brooklyn (N. Y.) Rapid Transit Company	16,566,900	Paid $22,200
Central Power & Light Company, St. Louis	60,000	Paid in full
Charleston (S. C.) Consolidated Railway & Lighting Company	350,000	Paid $13,006
Columbus (Ohio) Railway, Power & Light Company	642,000	Paid in full
Commonwealth Power, Railway & Light Company, Portland, Me.	4,800,000	Paid in full
Interborough Rapid Transit Company, New York	11,937,500	Paid in full
New Orleans Railway & Light Company	1,000,000	Paid in full
New Orleans Railway & Light Company	1,000,000	Paid in full
United Railways Company of St. Louis	3,222,000	Paid in full

New Brunswick Company Would Sell to City

J. J. Bodell of Bodell & Company, Providence, R. I., representing security holders of the New Brunswick Power Company, St. John, N. B., has made a proposal to the city for the sale to it of the entire property of the company, including the electric railway, gas and electric light undertakings. His idea would be to have the city assume the payment of the charges on all the interest-bearing securities of the company now outstanding and pay dividends on both issues of preferred stocks, securing title to the property through gradual liquidation of the purchase price of all the common and preferred stock. He has proposed:

1. That the company deliver to the city all the common stock covered by the option.
2. That the company pay the principal amount of outstanding bank loans as of this date.
3. That the company obtain the consent of the holders of the first preferred stock to a reduction of the present annual dividend rate from 7 per cent to 6 per cent.
4. That the company obtain the consent of the holders of the second preferred stock to a reduction of the present annual rate from 7 per cent to 5 per cent.
5. That the company obtain from the trustee of the mortgage a release of the water power rights and lands owned by the company and located on the Lepreaux and Magaguadavie Rivers.
6. That the city guarantee by endorsement the payment of the principal of the bonds and interest at the rate of 5 per cent per annum thereon, and the sinking fund.
7. That the city guarantee by endorsement the payment of quarterly dividends on the preferred stock.

Sanderson & Porter, New York, were recently engaged to take over the management of the property. This change was referred to in an article in the *Electric Railway Journal* for June 10, page 949, in which the affairs of the company were reviewed.

Surplus in Montreal

For the year ending June 30, 1922, the Montreal (Que.) Tramways Company reports gross earnings of $11,712,525 against $11,773,005 for the same period a year ago. Operating expenses and taxes decreased from $6,327,841 for the year ended June 30, 1921, to $5,769,403 for the year ended June 30, 1922. After subtracting operation costs, maintenance, etc., a balance of $3,315,962 for the year ended June 30, 1922, remained. After allowance considerations, City of Montreal rental, etc., retired. It is not the intention of the company to make any further issue at this time in connection with this retirement.

Service Discontinued

The gasoline cars in use on the lines of the Manhattan City & Interurban Railway, Manhattan, Kan., have been withdrawn and service has been discontinued. According to Joseph G. West, manager of the company, who announced the suspension of service, business has fallen off 50 per cent in the past year.

These gasoline self-propelled cars replaced the electric cars several months ago after the local power company had announced increased rates for "juice." The story was told in the *Electric Railway Journal* issue of July 8, 1922.

Security Issues Authorized

The directors of the newly-organized Spokane (Wash.) United Railways have authorized the issuance of $3,500,000 bonds to be covered by a mortgage for that amount in favor of the Farmers' Loan & Trust Company of New York. Issue of $1,500,000 preferred stock and $2,000,000 common stock was also authorized. The stocks and bonds have been prorated between the Washington Water Power Company and the Spokane & Eastern Railway & Power Company in payment for these two electric railway systems taken over by the new company.

Acquisition Deal Falling Through

The deal whereby the Springfield & Troy Railway was to acquire the properties of the Springfield, Troy & Piqua Railway has apparently fallen through. In consequence doubt is expressed as to the future of the traction line, which operates between Springfield and Troy, Ohio. According to H. H. Durr, chairman of the reorganization committee, the Springfield & Troy Railway secured an option on the property, but allowed it to expire without action. The deal was even carried up to the point of paying over of the initial purchase. Residents along the line have shown themselves disposed to invest in any company that takes over the line, in order to keep it in operation, as it is the only transportation service between Springfield and Troy.

Financial News Notes

Approves of Power Line Purchase.—The Railroad & Public Utilities Commission of Tennessee has approved the purchase of a transmission line by the Tennessee Power Company. The line is 21 miles long. It extends from Maryville to Knoxville. A bond issue of $250,000 has been authorized to cover part of the purchase price.

Back Dividend Declared.—According to a recent announcement of the Nashville Railway & Light Company, Nashville, Tenn., it is prepared to make the payment of $12.50 per share on the preferred stock deposited under the plan of organization of the Tennessee Electric Power Company. Dividend payments will amount to $312,500.

$5,000,000 Issue Authorized. — The Illinois State Commerce Commission has authorized the Chicago & West Towns Railroad to issue a trust deed to Harris Trust & Savings Bank as security for a $5,000,000 mortgage loan. Permission to issue $1,000,000 of the mortgage bonds dated July 1, 1922, and maturing in ten years, also has been granted.

Gold Certificates Offered.—Halsey, Stuart & Company, New York, N. Y., are offering at prices yielding from 5½ per cent to 6½ per cent $725,000 Cincinnati (Ohio) Traction Company 6 per cent equipment trust gold certificates, maturing serially 1923 to 1932. The certificates are issued under the Philadelphia plan and represent about 75 per cent of the cost of seventy-five new double-truck motor cars.

Line Ordered Dismantled.—As the result of a recent decision of Judge Luse in the District Federal Court at Superior, Wis., the old Wisconsin Interurban Electric line will be dismantled. The line operated between Madison and Portage, Wis. The expense of razing the tracks, poles and other equipment will be borne by the city of Madison. The line has been in receiver's hands since 1919.

$30,000 Considered Too High for Park.—The committee appointed by the Mayor of Pittsfield, Mass., to negotiate with the Berkshire Street Railway for the purchase of a triangle in front of the union station in Pittsfield for a public park has reported that it regards the price—$30,000—named by the company as excessive, and also that it lacks authority to consider the matter of additional franchise privileges desired by the company as an added consideration. One request made was for a permit to lay a track across City Hall Park on the north side, and another was for a location for a siding in Dalton Street. The committee states that $20,000 is the utmost that the city should pay the railway for the land.

Traffic and Transportation

Franchise Before Council

Winnipeg Railway Will Offer Reduced Fare Schedule to Secure Ten-Year Renewal

The franchise problem confronting the Winnipeg (Man.) Electric Railway is now before the City Council. The special committee on street railway negotiations has presented two reports, the majority report favoring ultimate public ownership and the minority report suggesting the city finance the company up to an estimated sum of $2,500,000 or extend the franchise for ten years as requested by the company for a consideration.

If the city will agree to postpone the first period in which it may acquire the railway utility from 1927 to 1937 the railway has made definite promises to revise the schedule of fare which will put the entire system on a 5-cent fare during certain hours of the day.

It will mean that within three years all fares are to be reduced to 5 cents. The plan is worked out in the accompanying table.

AUGUST 1 1922		
Cash fare	7 cents	
White tickets	4 for 25 cents	Good at all times.
Red tickets	5 for 25 cents	Good from 6 to 8 a.m. and 5 to 6.30 p.m.
Sunday fare	5 cents cash	
Children's tickets	8 for 25 cents	Good for children under 16 at all times.
AUG. 1, 1923		
Cash fare	6 cents	
White tickets	6 for 35 cents	Good at all times.
Red tickets	5 for 25 cents	Good from 6 to 8 a.m. and 5 to 6.30 p.m.
Sunday fare	5 cents cash	
Children's tickets	8 for 25 cents	Good for children under 16 at all times.
AUG. 1, 1924		
Cash fare	6 cents	
White tickets	9 for 50 cents	Good at all times.
Red tickets	5 for 25 cents	Good from 6 to 8 a.m. and 5 to 6.30 p.m.
Sunday fare	5 cents cash	
Children's tickets	8 for 25 cents	Good for children under 16 at all times.
AUG. 1, 1925		
Cash fare	6 cents	
All adults' tickets	5 for 25 cents	Good all days all times.
Children's tickets	8 for 25 cents	Good for children under 16 at all times.

A. W. McLimont, vice-president of the Winnipeg property, does not believe that the proposal to have the city finance the company will be taken seriously. He said that there were many difficulties to be taken care of if the city should lend large sums to the company and also that the amount proposed to be advanced would not be sufficient to meet the purposes which the railway has in mind.

The company through its publication "Public Service News" has stated that besides offering reduced rates of fare it would be willing to extend its track and car service and to install such necessary motor bus service as may be agreed upon between the company and the city.

Urging no unreasonable delays "Public Service News" says:

> We believe that the present is the appropriate time to formulate a comprehensive development and construction plan for Winnipeg and an energetic start should be made looking to the provision of public services, not only to meet present immediate needs, but also to take care of the future. Any unreasonable delay will result in retarding the city's growth and development.

Better Business—Springfield Slogan

A determined "Better Business" drive has been launched by the Indiana, Columbus & Eastern, the Columbus, Newark & Zanesville, and the Ohio Electric traction lines. Forty-eight hour freight service between Cleveland and Springfield and way points has been started, and an express freight service established between Lima and Springfield as an auxiliary to the regular freight service. Through traction freight service will also be established to Detroit and other Michigan points in the near future. Several improvements in the Springfield headquarters for the benefit of shippers, directly or indirectly, are being made.

Transfer System Will Aid Transportation Companies

With the idea in mind of increasing electric railway patronage and of aiding merchants and the public in general the Prole Transfer System was recently incorporated under the laws of California with a capitalization of $1,000,000. Under the Prole plan, named after W. A. Prole, the founder, a system of coupon transfers would be installed and a co-operative agreement entered into by transportation companies, merchants and theater managers.

Mr. Prole said that the idea would be for the public to continue to pay the existing car rates, but to receive transfers between 9 a. m. and 4.30 p. m. and 7 p. m. to midnight. These transfers would have attached to them two 2-cent coupons which would be redeemed by merchants and theatre managers on the basis of 2 cents on each cash purchase of 25 cents or multiple thereof. The system has been advertised in newspapers and periodicals.

Urges Extension

Efforts Being Made to Force Los Angeles Railway to Make Extension—Traffic Inadequate

Eleventh-hour efforts are being made to cause the California State Railroad Commission to hand down a decision ordering the Los Angeles Railway Corporation to extend one of its car lines up Vermont Avenue in Los Angeles from First Street to Griffith Park, regardless of the probable result that 10-cent fares would be ordered on all the Los Angeles Railway Company's lines in the City of Los Angeles to meet the cost of the extension. The addition would mean an expenditure of $600,000, and operating expense after completed of $6,000 per month, most of which monthly expense would represent a loss to the company, being more than the income that would be expected from the extended line.

The Railroad Commission has been made aware that a campaign of propaganda is being financed by real estate promoters, who are paying for posters and handbills which are being distributed in Hollywood urging citizens to petition the city and the commission to force the railway to extend its line to the park.

Promises to Install Necessary Bus Service

Griffith Park, is rated as the largest city park in the world, and real friends of the park declare the proposed motor bus line to and from the park, connecting by universal transfers between the Los Angeles Railway line and the cars of the Pacific Electric Railway lines will have the effect, which was the long-cherished desire of Col. Griffith, donor of the park, of making it cheaply accessible to people in all parts of Los Angeles.

Chief Engineer Osborne, of the Board of Public Utilities of the City of Los Angeles, and Chief Engineer Sachse of the State Railroad Commission have worked for the past three years for the maintenance of the 5-cent carfare on the Los Angeles Railway Company's lines in Los Angeles, and it was their survey and resulting operation economies effected on the Los Angeles Railway Company's operation costs that maintained this low fare in Los Angeles when lines in other cities throughout the United States were charging from 7 to 10 cents.

The tremendous growth of that portion of Hollywood lying between Griffith Park and First Street and Vermont Avenue and Western Avenue has been recognized by the Board of Public Utilities and the commission. The problem that is now before these regulatory bodies is how to give the additional service required to serve this population and to give improved transportation from all parts of the city to Griffith Park and at the same time not force the Los Angeles Railway and the Pacific Electric Railway to make extensions that would call for capital ex-

penditures that would be beyond the resources of these companies.

Admitting the need for extended crosstown service along Vermont Avenue to Griffith Park, Chief Engineer Osborne recommended to the Board under date of May 1 the establishment of motor bus line feeders to serve the newly built up Hollywood district.

"The Board of Public Utilities," Mr. Osborne stated in his report, which was approved by the board, "has consistently advocated the establishment of bus lines to develop new territory or to act as extensions into new territory which will not support electric railway construction." As far back as Nov. 12, 1921, the Board of Public Utilities recognized the need of improved transportation service for this rapidly developing part of Hollywood, and adopted recommendations of Chief Engineer Osborne:

Recognizing the need of giving car service to East Hollywood, the Pacific Electric Railway filed on Jan. 10, last, with the Board of Public Utilities, an application for a motor bus "feeder line" along Vermont Avenue from First Street to Los Feliz Boulevard, which is at the entrance to Griffith Park. This application is now pending before the board pending the State Railroad Commission's decision on the entire Hollywood transportation situation. The Pacific Electric Line also at the same time filed an application for a bus line permit from Larchmont Boulevard and Melrose Avenue to Highland Avenue and Cahuenga Boulevard. This second application is likewise pending until the commission makes its report.

MORE HOLLYWOOD PROPAGANDA

The State Railroad Commission in a recent decision on the matter of Pacific Electric fares ordered the company to give universal transfers to the Los Angeles Railway. The Los Angeles Railway may likewise be ordered by the Commission to give universal transfers to the Pacific Electric Lines' cars. The establishment of universal transfers in the near future will fit in with the Board's general plan for improvement of transportation conditions in the Hollywood district.

The Board of Public Utilities is taking no cognizance of the present propaganda in Hollywood for the extension of the Los Angeles Railway Company's lines to Griffith Park, for the board has repeatedly gone on record for a comprehensive plan for improved, rapid and adequate transportation service for all of Hollywood including universal transfers, a Pacific Electric subway under Bunker Hill for its Hollywood cars and lines and a larger number of cars on these lines. The Pacific Electric Railway Company is proceeding rapidly to secure rights of way and with its engineering plans for its $2,800,000 subway under Bunker Hill, and new cars, long ago ordered, are rapidly nearing completion and will soon be delivered and placed on the Hollywood service.

Jitneys Must Secure Permits from State

The Connecticut Supreme Court ruled on Aug. 4 that jitneys could not operate anywhere in the State without a permit from the Public Utilities Commission. This decision written by Justice Curtis upholds a former opinion given by Judge Booth in the Court of Common Pleas in which he imposed a fine upon Louis Darazzo, operator of a jitney between New Haven and Branford. The decision of the Supreme Court makes the jitney act constitutional and binding and gives the Public Utilities Commission full power to enforce the law.

After the general jitney clean-up by the Public Utilities Commission appeals were prepared to the Supreme Court, it being claimed that the jitney law was unconstitutional in that the Public Utilities Commission was vested with confiscatory instead of supervisory powers. All the other jitneymen except Darazzo dropped their plans to carry the fight to the Supreme Court. But Darazzo fought the case singlehanded. Arrested on the charge of violating the jitney law by operating a machine over a fixed route without a license from the Public Utilities Commission, the case came to the criminal side of the Court of Common Pleas.

There was no trial of the case, however, because Darazzo refused to plead and instead demurred to the information. In the demurrer the constitutionality of the jitney law was attacked, the claims being of about the same nature as those advanced at the hearing in the federal court before three judges on the same issues. Judge John R. Booth, sitting in the criminal side of the Court of Common Pleas, overruled the demurrer of Darazzo and asked the accused to plead. Refusing to do this the court found Dazarro guilty and imposed a fine. An appeal to the Supreme Court was taken and argued at the June term.

Detroit United Will Start Interurban Motor Bus Operation

That the Detroit (Mich.) United Railway will start running interurban buses for both freight and passenger service has been announced by E. J. Burdick, the company's vice-president and general manager. Details for the company's plan have not been made public but the proposed action is the result of the study of the subject by officials and engineers of the Detroit United Railway during the past two years. The company officials have arrived at the conclusion that motorbus transportation is an inevitable progressive step that can not be deterred. Interurban transportation by automobiles, it is cited, bears the same relation to electric interurbans that they then in turn bore to the steam roads. The interurbans and the railroads have proved essential to each other and to each other's progress.

The regulation of motorbuses is considered as essential to their own welfare and to the public weal and the Detroit United Railway will look to the state for proper regulation when it has entered the field of motorbus transportation. This regulation, Mr. Burdick stated, will be up to the Legislature and the Michigan Public Utilities Commission. No legislation to curb the motorbus will be asked as it is considered that such a course would be disastrous to the motorbus field and act as a check on what is considered a new and legitimate utility.

Another point considered essential is the proper regulation of the motorbus in its use of the state highways, the companies being held responsible for compensation to the public, based upon the volume of business handled over the highways. It is further cited that if the small operator can make a profit with only one or two automobiles, the Detroit United Railway with all its resources, can prosper in the field.

Transportation News Notes

Fare Decision Expected.—The New York Public Service Commission recently fixed Aug. 8 as the last day for hearings in the Syracuse fare matter. The city of Syracuse is fighting for lower rates on the lines of the New York State Railways. A decision of the commission is expected shortly.

Trolley Routes to Be Numbered.—In order to aid visitors in finding locations the United Traction Company, Albany, N. Y., has adopted a new system for designating car routes. Each route will be given a number and all cars will display on their sign boards the number of the particular route over which they operate. The present route signs list all the streets which the car traverses.

Fifty Per Cent Ride on Passes.—During the month of July it is estimated by officials of the New Brunswick Power Company, St. John, N. B., that 50 per cent of the rides for the month were on passes. When the pass system was installed it was announced that it was only an experiment, but passes have been in vogue for eight months and evidently will be continued indefinitely.

New Checks to Be Issued.—The Pittsburgh (Pa.) Railways is having made a new kind of token, which will be larger than the old one and more convenient for the car patron, who found it difficult to locate the small check. An advantage for the company is that the Pittsburgh ticket will have straight lettering on both sides unlike most car checks which have the lettering rounded. Because of this car checks from other cities could not very well be used in Pittsburgh. It will require the circulation of 4,000,000 checks a week to accommodate Pittsburgh car riders.

New Publications

Electric Arc Welding

By E. Wanamaker and H. R. Pennington. Published by Simmons-Boardman Publishing Company, New York. 254 pages, 167 illustrations, cloth, 6 x 9 in.

Based largely on a series of articles by the authors which were published in the *Railway Electrical Engineer*, this book on electric arc welding gives information that is in most demand for practical purposes.

As both of the authors were for years connected with the Rock Island Railroad the illustrations and information are taken largely from steam railroad practice, but most of the applications are adaptable to electric railway use. A large amount of practical information on many phases of the art has been incorporated. This includes descriptions of welding systems and their installations, phenomena of the metallic and carbon welding arc, training of operators, sequence of metal disposition for various types of joints and building up operations, electrode materials used, welding ability of various metals, welding composition, thermal disturbances of parts affected by the welding process, physical properties of completed welds, efficiency of welding equipments expressed in pounds of metal used or deposited per kilowatt hour, and welding costs. The section on training operators for arc welding is particularly complete, and if the suggestions given are followed they should result in better workmanship and a broader application of the art of welding.

Railway Signaling

By Everett Edgar King. McGraw-Hill Book Company, Inc., New York City. 363 pages. Illustrated.

Professor King, who is head of the railway civil engineering department of the University of Illinois, has put into convenient form for study and reference the elements of railway signaling. While necessarily and naturally the subject is approached from the standpoint of the steam railroad, the signaling principles applicable on electrified roads are given. The treatment also includes highway signals, which are of interest to all railways crossing highways.

In appendixes Professor King gives the rules governing the construction, maintenance and operation of interlocking plants, prepared jointly by the engineers of the Railroad Commission of Wisconsin, the Railroad and Warehouse Commission of Illinois, the Railroad and Warehouse Commission of Minnesota and the Public Service Commission of Indiana and adopted by their respective commissions; a memorandum on the essentials of signaling incorporated in the report of the committee on transportation of the American Railway Association and included in the manual of the Railway Signal Association, and a set of definitions of terms used in railway signaling, taken from the Proceedings of the Railway Signal Association.

An Investigation of the Fatigue of Metals

University of Illinois Experiment Station Bulletin No. 124. Urbana, Ill.

This report covers the results of an investigation conducted at the experiment station in co-operation with the National Research Council, the Engineering Foundation and the General Electric Company, by Profs. H. F. Moore and G. B. Kommers. The tests were performed by means of the best modern available apparatus and their scope was sufficient to permit some general conclusions to be drawn, which are given in compact form. The way was also indicated for other researches which are needed to shed light on some parts of the subject.

The following significant conclusion will be read with interest:

"The phenomenon known as 'fatigue' of metal under repeated stress might better be called 'the progressive failure' of metal. The most probable explanation seems to be that such failure is a progressive spread of microscopic fractures. A nucleus for damage may be a very small area of high, localized stress, due to a groove, a scratch or a crack; in other cases failure may be due to internal inclusion or irregularities of structure; it may be due to internal stress remaining after heat treatment; it may be due to a grain or group of grains unfavorably placed to resist stress; or failure may begin in the weaker grains of a metal whose structure consists of two or more kinds of grains; or it may, of course, begin in any portion of the metal, which, by accidental overload or otherwise, is stressed to the yield point."

E. M. F. Electrical Year Book

A combined dictionary, encyclopedia and trade directory of the electrical industry. Published by the Electrical Trade Publishing Company, Chicago. 843 pages.

As its sub-title suggests, this book combines definitions of electrical terms, short articles of an encyclopadic nature, and brief descriptions of 3,000 electrical and other closely related products made by and used by the electrical industry. Each article so described is followed by a list of its American and Canadian manufacturers. Manufacturers have the privilege of inserting advertisements of a descriptive nature about their own devices in addition to the regular listing of their names under the classified products, but all such advertisements are marked with an abbreviation "Adv." It is the announced intention of the publishers to revise the information contained in this book each year to accord with the latest developments, to bring all definitions up to current usage and to correct all listings of products and producers to the date of each yearly edition.

Hydro-Electric Service Report

Third Annual Report of Government Hydro-Electric Service of the Netherlands' East India. Bandoeng, Java.

This comprehensive, beautifully illustrated report (in Dutch) contains a complete summary of the water power situation in the Netherlands' East India, particularly in Java. The report also covers Sumatra, Celebes and Algemeen. A series of appendixes contains maps and data in diagrammatic form, showing the available water powers in these colonies. The subject is of transportation interest because the Netherlands government has extensive plans for electrification in Java, where grades are steep and water power is plentiful.

Psychotechnik und Taylor-System

By K. A. Tramm, transportation engineer, Berlin, Germany. Published by Julius Springer, Berlin, 1921.

In a well illustrated book of about 140 pages, Mr. Tramm tells of the work which is being done on the Berlin street railway system in selecting and training men by means of modern psychological methods. Mr. Tramm's work was described in an article in the *Electric Railway Journal* for Jan. 28, 1922, page 143. This book covers the same field as the article, but in much more detail. In sending a copy of his book to the *Electric Railway Journal*, Mr. Tramm wrote that the tests described have worked out very well indeed.

Engineering Standards Committee

Work of the Engineering Standards Committee. 1921. Published by the committee, 29 West Thirty-ninth Street, New York City.

This pamphlet contains an explanation of the organization and methods of working of the committee, together with a list of co-operating bodies and another of projects which have an official status before the committee, including approved standards.

Pyrometric Practice

Technologic paper No. 170, United States Bureau of Standards, Washington, D. C.

Several members of the physics staff of the bureau have compiled this treatise of more than 300 pages, covering the subject of pyrometry in both its scientific and practical aspects. The work will be of value to all who have to do with the measurement of high temperatures.

"Engineers and Engineering," published by the Engineers' Club of Philadelphia, contains in its July, 1922, issue the full text of a paper on "Paving Between Tracks and Adjoining Rails" by E. J. McIlraith, Philadelphia Rapid Transit Company. The discussion following the presentation of the paper is included. Mr. McIlraith's paper was abstracted in the issue of the *Electric Railway Journal* for July 29, 1922.

Personal Mention

New York Surface Lines Report to General Andrews

Sixteen surface lines of New York City are now under the special charge of Brigadier-General Lincoln C. Andrews, chief executive of the Transit Commission. He will hear complaints, make decisions, and make known the commission's instructions. The railway companies will have the right to appeal to the commission on any decision.

This concentration of power eliminates the necessity for the commission to issue orders concerning service and equipment to individual lines. That method was followed with the rapid transit lines. General Andrews will now supervise the service, and set standards which are to be reached by the surface companies as soon as possible. The responsibility for performance and adherance to rules is left with the individual companies.

General Andrews was appointed to the Transit Bureau in 1921 to take charge of the various departments. His work consists in the assignment of duties, and the supervision and correlation of all the departments. He is a graduate of West Point, and served in France during the World War. After the armistice he became Assistant Provost Marshal General of the Expeditionary Forces.

C. H. Hardesty Chief of New Traffic Department

A department of traffic has been created by General Manager E. B. Moore of the Monongahela Power & Railway Company, Fairmont, W. Va., whose order places C. Howard Hardesty, general traffic agent, in control of the new department.

The duties of the new department manager will be to control on both the local and the Parkersburg-Marietta divisions, the passenger, freight and express traffic. He shall also have charge of the matter of rates on such traffic and shall have supervision and direction of all passenger ticket offices and freight offices and of all passenger and freight agents.

In the past the local traffic agent worked under the instructions of the manager of railways and he had no jurisdiction over traffic on the Parkersburg-Marietta divisions which was handled exclusively by the officials of that division.

L. M. Brown Made Superintendent of Interstate Property

L. M. Brown since 1917 superintendent of transportation for the Interstate Public Service Company, Indianapolis, Ind., has been appointed general superintendent of all railway property of the Interstate company. He has been with the company for seventeen years. His first position was that of conductor. Later he was made dispatcher and trainmaster, and finally superintendent of transportation.

New Springfield Manager

John S. Bleecker to Take Executive Charge of Indiana, Columbus & Eastern Traction Company

John S. Bleecker has been appointed by Receiver J. H. McClure to be general manager for the receiver for the Indiana, Columbus & Eastern Traction Company, and Columbus, Newark & Zanesville Electric Railway. The announcement was made recently at the general offices of the companies in Springfield, Ohio. Mr. Bleecker will have his headquarters in Springfield.

J. S. BLEECKER

Mr. Bleecker will step into this work as easily as an ex-service man falls into line when he drills with his two-year-old son. For Mr. Bleecker formerly managed the New Orleans Railway & Light Company, the Columbus (Ga.) Electric Company and the Columbus Railroad, and the Myles Salt Company at New Orleans. Since January of this year Mr. Bleecker has been associated with the Electric Bond & Share Company of New York, N. Y.

His experience extends to a number of other companies in Seattle, Boston, Paducah and Houghton, where he represented Stone & Webster, Inc. He was first associated with this management corporation in 1900, and the connection remained until he was appointed manager of the New Orleans company in 1919. It was while he was with Stone & Webster that he was general manager, under a receivership, of the Columbus Electric Company and the Columbus Railroad, and made a remarkable record.

Mr. Bleecker has already assumed active charge in Springfield. Mr. McClure had been devoting his full time to the operation of the two traction companies prior to his appointment as vice-president and general manager for the Chicago, Aurora & Elgin Railroad, but the latter necessitated his removing to Chicago.

Legion Cross Presented to A. E. Kennelly

For distinguished services as exchange professor in engineering to the French Republic, the Cross of the Legion of Honor has been awarded to Dr. A. E. Kennelly, professor of electrical engineering at Harvard University and the Massachusetts Institute of Technology. Dr. Kennelly was the first exchange professor sent to France from America under the scheme of regular annual exchange of professors in engineering and applied science, inaugurated last fall between the French University Administration and seven American institutions.

Professor Kennelly is the third American engineer thus to be honored recently, the others being Colonel Arthur S. Dwight, President of the American Institute of Mining and Metallurgical Engineers, and Charles F. Rand, chairman of the Engineering Foundation.

C. D. Baker is now directing transportation matters of the Long Island Railroad as general superintendent. He was formerly assistant superintendent and now is filling the position held by J. R. Savage.

Clarence H. Hitchcock, who has been chief clerk to the general superintendent, has been appointed inspector of the Rockford & Interurban Railway, Rockford, Ill. Mr. Hitchcock will have general supervision of operation.

W. N. Beasley, a lawyer of Halls, Tenn., has been appointed to the Tennessee Railroad and Public Utilities Commission by Governor Alfred A. Taylor to succeed the late Col. B. A. Enloe. Julian H. Campbell has been elected chairman. Col. Harvey Hannah is the other member of the commission. Mr. Hannah is now a candidate for the Demcoratic nomination for Governor.

Obituary

Cornelius Van Vorst Powers, chief of one of the bureaus of the New York (N. Y.) Transit Commission, died a short time ago.

Ernest A. Wenzel, for many years chief inspector in the Eastern District of the Brooklyn (N. Y.) Rapid Transit Company, died on June 24 at his home in Brooklyn.

James H. Horne, sixty-four years old, nationally known designer of passenger cars and former superintendent of the Barney & Smith Car Company, Dayton, Ohio, died very suddenly in Dayton recently.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Miners Plan Partial Truce

Buyers of Coal Are Awaiting Developments of the Cleveland Conference and as a Result Orders for Coal Have Eased Off Slightly—Priority Orders Are Few and the Car Supply Remains Short.

The pinch of coal shortage is becoming severe in several portions of the country. Spokesmen for the fuel distributor stated this week that great pressure is being brought from the New England states and by states in the Northwest and in the Middle West.

Secretary Hoover stated that failure to observe the price maximum applied only to an insignificant portion of the tonnage being produced. No increases have been allowed in the maximum price, he stated, in those districts where the 1920 wage scale has been put into effect. He emphasized that the price agreement is for the period of the strike only, but he said the settlement of the strike will not necessarily take the lid off of prices.

The conference of bituminous operators and miners called by John L. Lewis of the United Mine Workers at Cleveland, Ohio, Monday adjourned its sessions daily. Operators not present were thus to be given time to reach the conference, it was stated. The real reason for the adjournment, however, it is generally understood, was to take under consideration the Crews-Glasgow plan for settlement of the strike. The original meeting—the attempted Four-State conference—was held in abeyance to see what would happen to the proposed Crews-Glasgow scheme. The plan now is that if the operators not present still hold aloof to try and form an agreement among those taking part in conference. A committee was appointed Friday to draft a new wage scale and agreement.

Slight Decrease in Coal Demand

Demands for coal have eased off a trifle in the past week. There is, of course, no dearth of orders for all the coal that is being mined, but there has come an abatement in the rush as buyers prefer to await developments of the Cleveland conference. The cessation of feverish buying has been accompanied in some instances by curtailed industry activity and further efforts toward fuel conservation by utilities and carriers. In some sections the shortage is now acute; this is responsible for many Lake vessels tying up because of no bunkers and shortened operating schedules at steel mills in the Youngstown district.

Railroads are functioning better, production has increased slightly, and while congestion of loads is still the main bar to heavier non-union production, the accumulated tonnage on wheels is slowly being untangled and sent to destination.

Coal Age Index of spot bituminous prices dropped 45 points to 511 on Aug. 7. This corresponds to an average mine price of $6.18, as compared with $6.73 on July 31. Buyers who must have coal are paying gilt-edged prices for it, unless they are fortunate enough to be lined up with connections who are using the Hoover price as a basis of sale. The list of operators in this category is growing rapidly, however, and in the Midwest the Hoover level may be considered the minimum price of today, with the range continually narrowing as less and less coal moves at the high prices of last week. No seller wants to have high-priced coal confiscated at the Hoover level and there is also a growing feeling among producers that the wisest policy is to accept a reasonable return, especially as the car supply is to be contingent upon the observance of fair prices.

Contrary to expectations, priority orders have not swamped the mines now operating nor has the car supply improved materially, even for those producers who had accepted such preferential business.

The feeling that a resumption of union mining is impending is reflected in this week's market for British coal in this country. Heavy orders had been placed in Great Britain for consumers in New England and the Atlantic seaboard but cancellation of some of these orders, amounting to many thousands of tons, followed the events of the week in the coal trade. As delivery of British fuel involves several weeks' time, no consumer wants to have much of this tonnage enroute or on unfilled orders when there is a prospect of home-mined coal being available in the near future.

Coal Shortage Felt at Steel Mills

The fuel stringency has become much more pronounced at iron and steel works, according to a review of conditions in this week's *Iron Age*. In the Chicago, Cleveland, Youngstown, Pittsburgh and Buffalo districts a dozen more blast furnaces have been forced to suspend. As many more are likely to be thrown idle by another week, and indications are that in two weeks several steel plants will be forced to stop.

It is plainly indicated that for a good many weeks but a small percentage of newly mined coal will go into the production of iron and steel. There is no excitement among consumers, and little of the scramble for material that is often seen in time of scarcity.

July output of steel ingots showed an expected decrease from June, but it was not large. The estimated daily rate for the country was 113,700 tons, as compared with 115,800 tons in June and 114,700 tons in May. August will show a pronounced falling off.

Bids Received for Station Work and Yard Track

The New York Transit Commission has received bids to cover the changes required in the steel work at the east end of the Bridge Plaza station, Long Island City, to make possible service by the Brooklyn Rapid Transit Company beyond the plaza station, at which Brooklyn Rapid Transit trains operating in the Broadway subway, Manhattan, now terminate.

The commission also received eight bids for an additional approach track for the Lenox Avenue branch of the Lexington Avenue subway into the Interborough yards at Lenox Avenue and 147th Street. This contract will require the construction of a few hundred feet of subway and an open cut.

Food Prices Increase

The U. S. Department of Labor, through the Bureau of Labor Statistics, has issued compilations showing changes in the retail cost of food in twenty-four representative cities.

During the month from June 15, 1922 to July 15, 1922, fifteen of the twenty-four cities increased as follows: Manchester and Portland, Me., 4 per cent; Bridgeport and New Haven, 3 per cent; Chicago, Denver, Fall River and Milwaukee, 2 per cent; Atlanta, Baltimore, Columbus, Houston, Jacksonville, and Salt Lake City, 1 per cent. In Pittsburgh there was an increase of less than five-tenths of 1 per cent. The other nine cities decreased as follows: Philadelphia and Richmond, 2 per cent; Cincinnati, Detroit and Kansas City, 1 per cent; Little Rock, New York, Scranton and Washington, D. C., showed a decrease of less than five-tenths of 1 per cent.

Metal, Coal and Material Prices

Metals—New York	Aug. 8, 1922
Copper, electrolytic, cents per lb.	14.00
Copper wire base, cents per lb.	15.625
Lead, cents per lb.	5.77
Zinc, cents per lb.	6.57
Tin, Straits, cents per lb.	32.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$8.875
Somerset mine run, Boston, net tons	6.875
Pittsburgh, mine run, Pittsburgh, net tons	....
Franklin, Ill., screenings, Chicago, net tons	....
Central, Ill., screenings, Chicago, net tons	....
Kansas screenings, Kansas City, net tons	4.875
Materials	
Rubber-covered wire, N. Y., cents per lb.	6.05
Weatherproof wire base, N. Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	$2.05
Linseed oil, (5-bbl. lots), N. Y., cents per gal.	91.50
White lead, (100-lb. keg), N. Y., cents per lb.	12.50
Turpentine (bbl. lots), N.Y., per gal.	$1.16

Rolling Stock

Chicago (Ill.) Elevated Railroads has ordered 100 motor cars from the Cincinnati Car Company. Baldwin trucks will be used. As stated in these columns in the May 13 issue, these cars will be similar to cars already in service but particular attention will be given to provide increased comfort to passengers.

Chicago, Aurora & Elgin Railroad, Aurora, Ill., has placed an order with the Pullman Company for nineteen steel passenger cars and one dining car.

Great Northern Railway, St. Paul, Minn., has purchased four rail motor buses to be used in short line service.

Muskegon Traction & Lighting Company, Muskegon, Mich., recently spent $12,000 in new motors for its cars. The company is considering the purchase of double-truck cars for winter use. No definite decision, however, has been reached in this regard.

Southern Indiana Gas & Electric Company, Evansville, Ind., has bought four new safety one-man cars to take the places of the ones destroyed when the car houses of the company burned several weeks ago. The company is also building five double truck cars.

Hull (Que.) Electric Company has added two one-man safety cars to its rolling stock equipment. The cars are 21 ft. long, 8 ft. 1¼ in. wide and seat forty-one persons. The car bodies are of semi-convertible type with wooden sides and were built by the Ottawa Car Manufacturing Company.

New Orleans Railway & Light Company, New Orleans, La., will purchase the 100 new cars following authorization by Judge Rufus Foster of the United States District Court for the eastern district of Louisiana. The bids of the J. G. Brill Company, Philadelphia, Pa., for seventy-five cars and that of the Perley A. Thomas Car Works, of High Point, N. C., for twenty-five cars, were approved by the court. The cost of the equipment is estimated at $1,186,755. The order of the court authorizing the purchase makes the purchaser of the railway system, at the coming public auction on Aug. 17, assume the contract of paying for the equipment.

Power Houses, Shops and Buildings

American Water Works & Electric Company, New York, N. Y., is considering extensions to its power system to take care of the rapidly developing business of the company. The improvements will approximate $1,000,000.

Ohio Service Company, Coshocton, Ohio, has purchased the plant, equipment and lines of the Sugar Creek Light & Power Company, supplying current to Walnut Creek, Sugarcreek, Shanesville and Baltic. The plant will be connected with the Ohio Service Company's line in Dover on Aug. 1. The Ohio Service Company has an option on the plant, equipment and lines of the Zoar Battery Company at Zoar, which supplies Zoar, Bolivar and Mineral City with light and power.

New Orleans Railway & Light Company, New Orleans, La., is contemplating among the improvements in the immediate future, involving an outlay of nearly $750,000, the erection of two additional substations in New Orleans. The Bourbon Street substation is to be rebuilt and equipped with a 2,000-kw. motor generator and furnished with additional 233 volt d.c. feeders for the Edison system and two a.c. 6,600 volt feeders are to be transferred from the Central station. The other substation will be erected on Dryades Street. Dwight P. Robinson & Company, Inc., New York, will have charge of the new work. They are now installing the new turbine at Market Street.

New Incorporations

Dixie Traction Company, Beechwood, Ky., has filed articles of incorporation with a capital stock of $10,000. William T. Russell of Cincinnati and men from Covington are the incorporators.

Trade Notes

Scheld Engineering Corporation, New York, N. Y., has been appointed metropolitan and export representative for the Franklin Moore Company, Winsted, Conn., manufacturer of material handling machinery.

Conveyors Corporation of America, Chicago, Ill., announces that Monroe L. Patzig of Des Moines, Ia., has been appointed representative for the sale of its American trolley carrier in central Iowa.

The Dayton (Ohio) Mechanical Tie Company reports that the Gary Street Railway has just ordered a large number of Dayton Resilient ties for further improvements of tracks in Gary, Ind. This is the third order placed since the initial installation of this type of tie.

Charles P. Steinmetz, chief consulting engineer of the General Electric Company, Schenectady, has been nominated for State Engineer and Surveyor of New York by the Socialists. The platform of the Socialists declares for public ownership and operation of all public utilities. It condemns the New York Transit Commission for alleged favoritism.

Perey Manufacturing Company, New York, N. Y., announces that it has received the contract for equipping the Frankford elevated line with forty-seven of its standard type passimeters, and in addition the Philadelphia Rapid Transit Company has purchased twenty-eight of this type for installation at points on their system where changes were necessary through putting the Frankford Elevated Railway into operation.

Florandin Equipment Company, New York, N. Y., has been organized by C. H. Florandin with offices at 110 West Fortieth Street, New York, to act as representative of the Conveyors Corporation of America, Chicago, manufacturer of the American steam jet ash conveyor and the American trolley carrier. The new organization will also do a general contracting business in and around boiler rooms and industrial plants located in New York and its vicinity, erecting and installing the lines of equipment which the organization handles. Mr. Florandin has had wide experience in this work, for several years being eastern manager of the Conveyors Corporation before forming his own company.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., announces a number of changes in personnel. R. B. Mildon has been appointed general manager of the stoker department, with headquarters at South Philadelphia. G. A. Sacchi, formerly manager of the stoker section, has been appointed manager of stoker sales and will have his headquarters at South Philadelphia. Edgar Woodrow has been appointed manager of the contract division of the stoker department. F. G. Hickling is now manager of the railway division of the Pittsburgh district office. Norman Stewart is branch manager of the Minneapolis office. S. R. Shave has been appointed manager of the price section of the power and railway departments, East Pittsburgh. M. C. Rypinski of the radio sales division has transferred his headquarters to New York as a branch of the headquarters sales department. A. Heckman is now works electrical engineer for the East Pittsburgh works of the company.

New Advertising Literature

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has just published leaflet No. 3,428, describing the advantages of rolling contact for control apparatus.

Irving Iron Works, Long Island City, N. Y., has issued an eight-page bulletin, describing the construction of their subway grating. A table of safe loads for the various types used is included.

Armstrong Cork & Insulation Company, Pittsburgh, Pa., has recently issued a booklet entitled "A Neglected Source of Economy," which deals with the savings that can be effected in manufacturing plants by the use of refrigerated drinking water systems. A copy of the folder will be sent free of charge to those who ask for it.

The Hardwood Manufacturers' Institute, Memphis, Tenn., has issued a pamphlet entitled "The Hardwood Manufacturers' Institute." This contains reprints of several addresses and resolutions introduced at a recent meeting of the Institute. The pamphlet also contains information as to its purposes and policies.